PAPER 319

THE TRANSCENDENTAL MEDITATION PROGRAM AND A COMPOUND PROBABILITY MODEL AS PREDICTORS OF CRIME RATE CHANGE

MICHAEL C. DILLBECK
Maharishi International University, Fairfield, Iowa, U.S.A.

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The percentage of participants in the Transcendental Meditation programme was found to be a reliable predictor of increased social order, as reflected by a decrease in crime rate, in cities of the Kansas City metropolitan area between 1974 and 1976. It was further found that crime rate began to decrease when numbers practising Transcendental Meditation reached one percent of a city's population.—EDITORS

A probability model of crime rate incidence and change based upon the principles of collective consciousness outlined by Maharishi Mahesh Yogi was tested in three studies. The first two studies assessed the accuracy of the model in predicting variation among cities in existing level of crime rate and in predicting growth of crime rate over time. In the third study the model was used to measure the influence of the Transcendental Meditation (TM) program; this influence predicted decrease in crime rate among cities in the Kansas City metropolitan area during the years 1974 to 1976. The percentage of TM participants was as effective as the probability model as an overall predictor of crime rate decrease, and more accurate as the predictor of the exact point (one-percent TM program participation) at which decreased crime rate began. The final study also investigated alternative predictors of the decreased crime rate found in this sample, indicating that the effect of the TM program was independent of demographic variables.

INTRODUCTION

The Transcendental Meditation (TM) program has been extensively documented by scientific research to enrich the quality of individual life, in terms of physiological, psychological, and behavioral functioning, through the development of individual consciousness (see Orme-Johnson and Farrow, 1977, for
Maharishi states that the quality of collective consciousness of any unit of society, such as family, city, state, or nation, is the expression of the quality of the consciousness of each of the individuals within the social group. The relationship between individual consciousness and collective consciousness is a reciprocal one; collective consciousness is the expression of individual consciousness, yet it in turn influences the quality of life of individuals in the society.

Maharishi (1977) locates the fundamental determinant of the quality of social life as the degree of integration or coherence of collective consciousness. In a society characterized by a highly coherent collective consciousness, individual needs and social progress are spontaneously integrated; in such a society social progress does not restrict individual freedom, and the diversity of individual behavior does not undermine social cohesion or the collective progress of society.

One of the most important aspects of Maharishi’s theory of collective consciousness is that the basis of both individual and collective consciousness is a common field of consciousness, pure consciousness, experienced during the Transcendental Meditation (TM) technique. Individuals participating in the TM program enliven the unifying value of this underlying field, creating an influence of coherence throughout the collective consciousness of the area. With as few as one percent of the population of an area creating such an influence, this increased coherence in collective consciousness is predicted to result in a measurable decrease in crime and other indicators of social disorder, and an improved quality of life throughout society (Maharishi Mahesh Yogi, 1977).

The underlying field of pure consciousness is also identified by Maharishi as the ground state of all the laws of nature, the basic field of existence. For this reason, when awareness of individuals is not connected with the field of pure consciousness, their actions are predicted to be out of harmony with the total potential of natural law. As a result, action is not in accordance with at least some of the laws of nature which promote and sustain the enrichment of individual and social life. This “violation of natural law” by the population at large is predicted to result in disorder or lack of coherence in collective consciousness, and this disorder is in turn reflected in the level of crime rate in the society and in other social parameters. With the passage of time, disorder in collective consciousness may continue to grow, leading to a disruption of the social fabric, unless there is a sufficient number of individuals creating coherence in the collective consciousness of the society.

Maharishi’s principles of collective consciousness were translated into the model presented in this paper in order to utilize these principles to predict existing levels of crime rate and growth of crime rate, as well as decrease of crime rate through the practice of the TM program. The model assumes that the behavioral phenomenon of crime rate is an expression of a more basic element which might be called “social disorder.” The central question which the model attempts to answer is: what is the probability of change in the level of social order of a community, given the increase of some influence within the community which is either disorderly or orderly in its effect? The existing prior degree of disorderly influence is taken as contributing to existing differences in crime rate between cities at a fixed time. An increase of disorderly influence within a community is taken as predictive of crime rate increase; similarly, an increase of orderly influence within a city is taken as predictive of crime rate decrease.

Because the relationship between individual and collective life is reciprocal, attempts to study crime may focus on either the individual or the collective level. Thus, two approaches frequently used to understand and predict crime have been the study of the social and psychological determinants of crime, and the study of the ecological determinants of crime. One dominant theme within the study of individual and social causes of crime has been that criminal behavior is a phenomenon learned from the environment; criminal behavior is viewed as the result of the assimilation of certain attitudes...
(Sutherland and Cressey, 1970) or as the result of conditioning of certain behaviors (Eysenck, 1964; Trasler, 1962). In contrast, the ecological analysis of crime often adopts an epidemiological approach, studying the spatial or chronological distribution of crime resulting from all the actions of the individuals in society (e.g., Shaw and McKay, 1942).

The present paper attempts to take into account the reciprocal relationship of individual and collective life from a broad perspective. It proposes a mathematical model for variations in the degree of "disorder" of a social group, and tests the usefulness of this model as a predictor of crime. The model is taken from probability theory and was originally proposed as a theory of individual learning (Bakan, 1953; Luce, 1959). However, this learning model is operationalized here for the epidemiological prediction of variations in crime rate in American cities rather than the prediction of individual behavior.

MATHEMATICAL MODEL

To formalize this approach by specifying relationships more precisely, let us denote the expression "social disorder" by the term \( h \), and the incidence of crime by the term \( g \). The probability of crime on the basis of a particular degree of social disorder \( (h) \) is expressed as \( P(g|h) \). The use of conditional probabilities is dictated by the assumptions of this approach, that social disorder and crime are related rather than independent phenomena. As subsequently outlined, the laws of conditional probability are used to specify the general functional forms of this relationship.

In the development which follows, this expression \( P(g|h) \) is therefore used in the model to represent an initial probability of crime. Variations in the probability of crime from this initial value are used to predict variations in crime rate.

It is hypothesized that the effect of the increase of disorderly influence is to increase the social disorder and increase the probability of crime. To translate this into the terms adopted above, let us express this hypothesis as follows. Let \( x \) be some disorderly influence. Denote by \( P_i \) the probability of crime \( g \) given both the original social disorder \( h \) and \( i \) units of the disorderly influence \( x \):

\[
P_i = P(g|h, i \text{ units of } x).
\]

Then, if \( R = \frac{P(x|gh)}{P(x|\bar{g}h)} \) and \( P_0 = P(g|h) \) (where \( \bar{g} \) is "not-\( g \)," or the absence of crime), we can write

\[
P_i = \frac{R^i P_0}{R^i P_0 + (1 - P_0)}.
\]

(See Appendix A for derivations.) The ratio \( R \) \((R > 1)\) denotes the degree to which it is more probable that the actual level of disorder is that indicated by one unit of \( x \) rather than simply \( h \), given the occurrence of crime rather than its absence. That is, the term indicates the degree to which disorderly influence \( (x) \) is associated more with crime \( (g) \) than with the absence of crime \( (\bar{g}) \).

Equation 1 indicates that with the linear increase of disorderly influences, the probability of crime increases in a nonlinear fashion until it reaches an asymptotic value of one. The initial value of this equation is \( P_0 \) \((P_0 > 0)\) when \( i = 0 \). The ratio \( R \) determines the rate of increase of the probability \( P_i \) in the absence of any association between any one unit of disorderly influence \((x)\) and crime \((g)\).

For \( R = 1 \), there is no increase in the probability of crime \( P_i \) no matter how many units of disorderly influence are present. If disorderly influence is strongly associated with crime \((e.g., R > 3)\), the probability of crime rises greatly with each unit of disorderly influence and the asymptotic value of \( P_i \) is reached at very low values of \( i \). Figure 1 shows the increase of \( P_i \), for \( R = 1.1, R = 1.5, \) and \( R = 3.0 \) with increasing units of disorderly influence.

In order to derive an expression predictive of crime rate decrease, one may ask: What is the probability of crime \( g \) given both the initial social disorder \( h \) and \( i \) units of an orderly influence \( \bar{x} \)? Let \( P_j \) denote this new probability.

\[
P_j = P(g|h, j \text{ units of } \bar{x}).
\]

As derived in Appendix A,

\[
P_j = \frac{P_0}{P_0 + S^j (1 - P_0)}, \tag{2}
\]

where \( P_0 = P(g|h) \), \( j \) indicates the number of units of \( \bar{x} \), and where \( S \) is the ratio of \( P(\bar{x}|gh) \) to \( P(\bar{x}|\bar{g}h) \).
FIG. 1. THE PROBABILITY OF CRIME, \( P_i \), AS A FUNCTION OF UNITS OF DISORDERLY INFLUENCE, \( x \), FOR SEVERAL VALUES OF \( R \)

Equation 2 states that with the introduction of an increasing amount of orderly influence, the probability of crime decreases nonlinearly until it reaches an asymptotic value of zero. When \( j = 0 \), the initial value of equation 2 is \( P_0 (P_0 > 0) \). The ratio \( S(S > 1) \) plays a role parallel to that of \( R \) in equation 1. This ratio \( S \) determines the rate of decrease of the probability of crime; it denotes the degree to which orderly influence \( (x) \) is associated more with the absence of crime \( (g) \) than with crime \( (g) \). If there is no more association between orderly influence and noncrime than between orderly influence and crime, then \( S = 1 \) and there is no decrease in the probability of crime \( P_j \) with some amount of orderly influence \( (j) \). However, with a high association between orderly influence and the absence of crime, the asymptotic zero value of \( P_j \) is reached at low values of \( j \).

These two equations for predicting the effects of disorderly or orderly influence on the probability of crime represent the framework of the model adopted in this paper. The operational meaning of these equations requires specifying sources of disorderly or orderly influence and specifying values of \( R \) and \( S \). This is done in the three studies which follow; each study tests a separate prediction of the model outlined above and makes the implications of the model concrete.

**STUDY 1**

In order to predict variations in crime rate between cities, equation 1 may be used to describe the hypothesized incidence of disorderly influence. In order to operationalize this equation, the variable \( i \) must be defined and the parameters \( R \) and \( P_0 \) specified.

The variable \( i \) refers to the amount of disorderly influence \( x \) which contributes to the level of social disorder, and hence the definition of \( i \) requires positing a source of disorderly influence. It is hypothesized here that the disorderly influence within a city is to some extent a function of the population size (e.g., Spector, 1975; Sutherland and Cressey, 1970). The source of this hypothesis is Maharishi’s statement that disorder in collective consciousness arises from each member of the society acting in a manner which is not in accordance with the laws of nature governing human growth.

In order to avoid simultaneously specifying the parameters \( R \) and \( P_0 \) by fitting the model to data, the simplifying assumption was made that \( R = S \). Bakan (1953) indicates that \( R = S = 1.35 \) may be taken as an approximate specification of \( R \) and \( S \), under one further assumption. This assumption is that \( P(x|g|h) \) and \( P(x|g|h) \) are positively correlated from case to case. That is, in a particular city, if \( P(x|g|h) \) is low compared to other cities, \( P(x|g|h) \) will also be low. This value of \( R \) and \( S(1.35) \) is used in all the analyses which are reported in this paper; specific values of \( P_0 \) are assigned in the method section of each of three studies described.

In order to assess most comprehensively the predictive value of the variable \( P_i \) as operationalized from equation 1, its usefulness should be compared with that of crime rate predictors used in prior criminological research. For this purpose, the following demographic predictors of city crime rate variation were chosen as comparison variables: city population (Spector, 1975; Sutherland and Cressey, 1970: 176–177); population density (Beasley and Antunes, 1974; Mladenka and Hill, 1976; Schmitt, 1957); unemployment rate (Spector, 1975); median income (Beasley and Antunes, 1974); percentage of families below poverty level (Mladenka and Hill, 1976); median years education, percentage change in residence, percentage employed in manufacturing, and percentage of older citizens (Quinney, 1966). This study describes the relative utility of these variables as predictors of crime rate in a large sample of American cities.

**METHOD**

**SAMPLE**—A sample of 108 U.S. cities was chosen from those cities for which crime figures were reported in the 1970 issue of *Uniform Crime Reports* published by the Federal Bureau of Investigation.
This sample consisted of random samples of 25 cities from each of the population groups 25,000–50,000; 50,000–100,000; 100,000–250,000; and 250,000–900,000. In addition all eight U.S. cities with population larger than 900,000 were selected. This method of selection of cities was adopted in order to ensure a roughly equal distribution of cities over the entire range of population values; this is important because population is tested in this study as a hypothesized source of disorderly influence.

PROCEDURE—For each city, values of each of the following predictor variables were determined from 1970 census data (County and City Data Book, 1972): population, population density, unemployment, per capita income, percentage of families below poverty level, median years education, percentage at same residence after five years, percentage employed in manufacturing, and percentage over age 65. Those variables above, which differed slightly from the predictors cited from previous research, were chosen as approximations to those variables which were available in this data source.

The variable \( P_i \) was also included as a predictor variable. In calculating \( P_i \), the parameter \( P_0 \) was set at 0.20 in order to fit the model most accurately, and the variable \( i \) was defined as the city population in units of 20,000. The criterion variable was 1970 crime rate, defined as the number of FBI “Total Crime Index” crimes per one thousand population. Multiple regression was employed as the major tool for assessing the predictor variables.

RESULTS

The bivariate Pearson product-moment correlation between each of the predictor variables and crime rate is listed in Table 1, along with intercorrelations among the predictor variables. The variable \( P_i \) from the probability model is clearly the most effective single crime rate predictor among the variables studied \((r = .60)\). The correlation between crime rate and city population, from which the variable \( P_i \) was derived, was \( r = .33 \).

In order to assess the usefulness of the variable \( P_i \) as a crime rate predictor in comparison with the combination of variables drawn from earlier studies, \( P_i \) and each of the nine other predictors were entered into a hierarchical multiple regression, which added at each step the variable which predicted the maximum remaining variance, provided that the amount of remaining variance predicted was significant at the .05 alpha level. This analysis yielded three significant predictor variables: \( P_i \), percentage unemployed, and population density. Their multiple correlation of \( r = .70 \) accounted for approximately one-half the variance in the crime rate scores.

A second multiple regression parallel to the above analysis was then performed, excluding the variable \( P_i \). The significant predictors from this analysis were percentage unemployed, population, median years education, and percentage in same residence. The multiple correlation was \( r = .58 \). Thus, the variable \( P_i \) predicted crime rate in the present sample as effectively as the combination of the other predictors.

<table>
<thead>
<tr>
<th>TABLE 1</th>
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<td><strong>CORRELATION MATRIX OF PREDICTOR VARIABLES AND CRIME RATE</strong></td>
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<tr>
<td><strong>VARIABLE</strong></td>
</tr>
<tr>
<td>1. Crime Rate</td>
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<tr>
<td>2. Probability Model (( P_i ))</td>
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<tr>
<td>3. Population</td>
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<tr>
<td>4. Population Density</td>
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<tr>
<td>5. Percent Unemployed</td>
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<td>6. Percent Families in Poverty</td>
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<td>7. Per Capita Income</td>
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<td>9. Median Years Education</td>
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<td>10. Percent Employed in Manufacturing</td>
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<tr>
<td>Manufacturing</td>
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<td>11. Percent Older than 65</td>
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</tbody>
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* \( p < .025 \)  ** \( p < .01 \)  *** \( p < .001 \)
STUDY 2

A second aspect of crime rate prediction to which equation 1 may be applied is the change of crime rate over time. Again, operationalization of equation 1 requires a hypothesis of a source of the disorderly influence contributing to social disorder. Within a generally stable population group (in which the variation predicted by Study 1 would be minimal), it is hypothesized, based on Maharishi’s principles of collective consciousness, that the repeated influence of the same population over time is a source of disorderly influence. Under this hypothesis, the variable \( t \) would be simply time itself. Bakan (1953) indicated that when time is the variable \( t \), equation 1 is equivalent, within a multiplicative constant, to a formula employed by Shock (1951) to predict biological cell growth. This study uses equation 1 in a similar way to predict the growth of crime rate over time.

METHOD

SAMPLE—The published crime rate data for the United States as a whole from the years 1931 to 1970 were selected for study. Because of the large number of city measurements which comprise each year’s figure, the many uncorrelated sources of measurement error should cancel each other, yielding greater overall accuracy than individual city figures. Given the present state of social assessment, it must be assumed that there are also correlated sources of error which do not thus cancel. Two of these are the growing number of cities included in the published FBI estimates, and the improvement in crime reporting stimulated by the FBI measurement.

PROCEDURE—Crime rate estimates for the United States between the years 1960 and 1976 were obtained from the FBI Uniform Crime Reports (1975, 1976). The FBI “Total Crime Index” used for these estimates includes murder and nonnegligent manslaughter, forcible rape, robbery, aggravated assault, burglary, larceny (over and under $50) and auto theft. It was also desired to see if earlier FBI crime data were consistent with the model adopted. Therefore, crime rates were calculated from the published FBI data for the years 1931, 1940, and 1950. Only these years were selected because, before 1960, the prior decennial census figures are used by the FBI when listing populations, and those three years should be most accurate. (The original 1930 monthly issues of the Uniform Crime Reports were not available to the author; 1931 was employed as the year with greatest population accuracy.) The published incidence of rape was reduced by half in making these three estimates, since beginning in 1958 the rape category was restricted to forcible offenses, and the FBI noted that one-half of the reported rapes for the prior year were forcible offenses (Uniform Crime Reports, 1958).

Bivariate correlations were used to compare the relative predictive power of the probability model with that of possible alternative rates of crime rate growth between the years 1960 and 1970. Later data were not included in these analyses because beginning in the early 1970’s a hypothesized source of increased social order, which is investigated in Study 3, was becoming prevalent enough possibly to confound the one-factor simplicity of the model adopted here.

In this operationalization of the probability model, the variable \( t \) denotes time in successive years \((1960 = 0, 1961 = 1, \text{ etc.})\) and \( P_0 = .05 \) in 1960 at the beginning of this time period. This value of an initial probability of crime adopted for 1960 was lower than the value of 0.20 employed for 1970 in Study 1; this is a constraint implied by the observed large increase in crime rate over that decade.

RESULTS

The correlation between the variable \( P_t \) and reported U.S. crime rate from the years 1960 to 1970 was \( r = .998 \). However, reported crime rate rose each year, and this raises the question of whether any monotonically increasing function might have a similar correlation. For this reason, least squares regression was employed to find the predicted values of crime rate for not only the probability model \((P_t)\) but also the best fitting exponential, power, or linear growth curves, of the form \( y = b e^{mx} \), \( y = bx^m \), or \( y = mx + b \), respectively. These predicted values correlated with reported crime rate as follows: \( r = .988 \) for the exponential curve, \( r = .80 \) for the power curve, and \( r = .972 \) for the linear prediction.

At such high values of correlation, particularly for the exponential and linear predictions, a more accurate test of relative fit of the different predictions is given by the sum of squared deviations of
the observed and predicted scores. As listed in table 2, this sum is 2.02 for the probability model, 10.46 for the exponential curve, and 29.02 for the linear approximation. The value of \( P \) from the probability model grew at a rate which was between that of the linear and exponential predictions, and which was very close to the reported crime growth from 1960 to 1970, as illustrated in figure 2. In addition, the Durbin-Watson test indicated that, for both the probability model and the exponential curve, the hypothesis of independence of serial errors of prediction could not be rejected. This means that the size of the correlations is not spurious due to an unaccounted autoregressive factor in the time series.

Table 2 also lists the reported and predicted crime rate values for these three prediction models for 1931, 1940, and 1950. These predicted values were generated by substituting negative values for the time variable \( (1950 = -10, \text{etc.}) \) in order to predict from the 1960 to 1970 period. Using this method, the probability model is most consistent with the observed crime rate data. Including all the listed years between 1931 and 1970, the correlation with reported crime rate was again \( r = .998 \) for the variable \( P \), \( r = .905 \) for the exponential curve, and \( r = .724 \) for the linear prediction.

Although the probability model predicts the pattern of growth of crime during this period very accurately, it does not contain any mechanism for explaining why the obvious increase in crime in the U.S. modeled here occurred during this particular time period. A more expanded model, possibly including demographic changes, would be necessary to provide such a mechanism.

When the predicted values of crime rate from the probability model are plotted against the reported crime rate for the years 1971 – 77, the reported crime rate begins to deviate downwards from the predicted values. In terms of the simple probability model adopted here, this implies the growth of some orderly influence in society. The following study tests the hypothesized source of orderliness—the Transcendental Meditation program—used to predict crime rate decrease.

**STUDY 3**

A model for the prediction of crime should also point towards practical means for its alleviation. The “disorder” of a society might yield to modification from two approaches: attempts to alter the struc-
tural characteristics of society which contribute to disorder, or attempts to enrich the orderly functioning of the individual members of society. The weakness of the societal approach is that the conditions predictive of crime rate are so weak that their ability to be modified is limited. Examples of these characteristics from Study 1 would be population size (as transformed by the probability model) or even unemployment. The weaknesses of the individual approach are both the questionable effectiveness of most means of improving the orderliness of individual behavior, and the expense and ethical problems involved in presenting such programs to an entire population, particularly if a large majority of a population must individually improve the orderliness of their functioning for a measurable macroscopic change to occur.

In the context of these concerns, it is interesting to consider several studies which cite striking evidence that only a small percentage of persons engaged in the Transcendental Meditation program is associated with decreased crime rate in city areas. A substantial amount of research evidence has accumulated since 1970 indicating that the Transcendental Meditation technique enriches the individual's physiological, psychological, and interpersonal functioning by culturing increased stability and flexibility in each of these areas. (For reviews, see Kanellakos, 1978; Orme-Johnson and Farrow, 1977.) One finding relevant to the concept of orderliness of individual functioning is that the phase-ordering of the electrical activity of different areas of the cortex has been found to increase during the TM technique, as measured by coherence of the EEG (Levine, 1976). If indeed an enrichment of functioning of only a small percentage of persons in a societal group could predict macroscopically measurable improvements in social order, then the individual approach to alleviating social disorder might be feasible.

Borland and Landrith (1977) tested the hypothesis that as a result of a number of individuals in a society experiencing integrated development in the direction of more orderly functioning, the social group as a whole will develop in the direction of increasing social integration. They reported evidence that in 11 cities in which the percentage of the population practicing the TM program reached one percent in 1972, crime rate decreased significantly the following year. In a group of 11 control cities matched for geographic area, population, and college population, the crime rate increased the following year, as did the national crime rate. This phenomenon of decreased crime rate with one-percent participation in the TM program was named the Maharishi Effect (Borland and Landrith, 1977).

Borland and Landrith (1977) speculated that the trend of increased orderliness within the “one-percent” cities of their sample (those with one percent practicing the TM technique) might be analogous to the phenomenon of a phase transition in the physical and biological sciences; they cite as an example the sudden transition of water to the more orderly structure of ice when cooled to its freezing point. The physicist H. Haken (1977) has also recently explored possible parallels between physical phase transitions and phenomena in biology and sociology.

Another study indicates that participation in the TM program also may predict crime rate change between cities within a single metropolitan area. Hatchard (in press) found that for three consecutive years after 1973, the percentage of participants in the TM program correlated significantly with yearly crime rate decrease within the cities of suburban Cleveland.

The purpose of the third study reported in this paper is to investigate whether participation in the Transcendental Meditation program is a predictor of crime rate decrease within the Kansas City metropolitan area. The study compares the probability model developed in this paper and the percentage of TM program participants as indices of the predicted positive influence of the TM program. In addition, the study also analyzes a number of other demographic variables, in order to assess whether any of them might affect the relationship between TM program participants and crime rate decrease; that is, if a variable predicts both TM program participation and crime rate change, it would have to be excluded as an alternative cause of the crime rate decrease in order to clearly measure the strength of the relationship between participation in the TM program and crime rate decrease.

In using the probability model to predict crime rate decrease, it is hypothesized that participation in the TM program is a source of orderly influence required for operationalizing equation 2. This equation, which was derived to predict decreased probability of crime, is based on the assumption that
the variable $j$ represents successive orderly influences in the absence of disorderly influence. However, Study 1 gives evidence that the population itself is a source of disorderly influence, and thus in a population $n$ with $m$ participants in the TM program, a mixture of disorderly and orderly influences would hypothetically result. Therefore, the variable $j$ in equation 2 is taken as $100m/n$, the percentage of TM program participants. The parameter $P_0$ in that equation is set equal to $P$, the predicted probability of crime given the city population; thus $P_j$ represents the lower probability of crime predicted by the hypothesized orderly influence of the TM program.

The percentage decrease in crime rate is then predicted by

$$\delta = (P_1 - P_j)/P_1$$

which is proportional to the percentage decrease in the probability of crime $g$ from its expected value $P_i$. It is hypothesized that the variable $\delta$ predicts crime rate decrease in the cities of the Kansas City metropolitan area, particularly within a sub-area of socioeconomic homogeneity. The effectiveness of the variable $\delta$ and the percentage of TM program participants in a city are compared as indices of the effect of the TM program within this sample.

METHOD

SAMPLE—A sample of cities in the Kansas City metropolitan area was selected which comprised those cities larger than 4,000 population which were within a 20-mile radius of the city center of Kansas City, Missouri. These 23 cities were: Belton, Gladstone, Grandview, Independence, Kansas City, Lee's Summit, Liberty, North Kansas City, Raytown, and Sugar Creek in Missouri; Bonner Springs and Kansas City in Wyandotte County, Kansas; and Fairway-Westwood, Leawood, Lenexa, Merriam, Mission-Countryside, Mission Hills, Olathe, Overland Park, Prairie Village, Roeland Park, and Shawnee in Johnson County, Kansas. In two cases, two adjacent cities were combined, because police statistics were not recorded separately (Mission-Countryside) or because the cities were very small (Fairway-Westwood, one square mile each).

PROCEDURE—The International Meditation Society of Kansas City provided the number of participants in the TM program in each city from 1970 to 1975. These records indicated that the city of Mission Hills reached the one-percent level of TM program participation in early 1972, while in the single month of July 1975, two other cities reached the one-percent level: Fairway-Westwood and Prairie Village. By the end of 1975, one other city, Leawood, had reached one-percent TM program participants.

On the basis of Borland and Landrith's (1977) initial evidence of crime rate decreases beginning when TM program participants reached the one-percent level, it was decided to study the crime rate data from 1971 to 1976 in three separate time periods. The first period, 1971 – 1974, constituted a baseline period. The second period compared the crime rate change in the one-year periods prior to and following July 31, 1975, when two cities reached the one-percent level, while the third period compared crime rate changes for the years 1975 and 1976, a delay of five months after the second period of the study.

For each reported analysis of the entire sample, the 11 cities of Johnson County in Kansas are also analyzed separately. Because this suburban area is the community of greatest socioeconomic homogeneity, it is viewed separately to see if the predicted effects are clearer in the absence of other interacting factors.

The rate of total “Part 1” crimes per one thousand population was employed as the criterion score; this crime figure includes murder, manslaughter (negligent and nonnegligent), rape, robbery, assault (simple and aggravated), burglary, larceny, and motor vehicle theft. Crime figures were collected from city police departments and divided by yearly population figures obtained from the city or interpolated from census estimates where city data were unavailable.2 In constructing crime rates for the years before and after July 31, 1975 (Period 2 analyses), 1975 and 1976 population estimates were employed, respectively.

For Period 1 (1971 – 1974) the criterion score was the least-squares linear regression slope, indicating crime trend over these years. For the city of Mission

2. For the city of Merriam, and for several of the cities in Kansas for the years prior to 1974, crime information was received from the Kansas Bureau of Investigation (KBI). The crime figure for Merriam for the last five months of 1974 for use in Period 2 was estimated from the total 1974 crime figure provided by the KBI. The total crime data for the city of Lee's Summit for the years 1971 to 1974 were unable to be obtained. Population estimates were obtained from Population Estimates and Projections, Series P-25 (1977).
Hills, which reached one-percent TM program participants in 1972, the 1968–1971 slope score was utilized to reflect prior trend in order to avoid confounding possible effects attributable to the major hypothesis.

For analysis of crime rate changes in Periods 2 and 3, the percentage of TM program participants and the variable \( \delta \) were calculated from the number of TM program participants on July 31, and December 31, 1975, respectively. In computing \( \delta \), \( P_i \) was calculated for the year prior to that of \( P_j \) so that, parallel to the crime rate data, \( \delta \) reflects a decrease in the probability of crime over one year. In addition, a value of \( P_0 \) of 0.25 in 1975 was adopted in calculating \( P_i \); an increase of \( P_0 \) from the value of 0.20 in 1970 is a constraint imposed by the reported increase in crime rate over that period. The variable \( i \) in calculating \( P_i \) was taken as population in units of 60,000 rather than the units of 20,000 employed in Study 1. This change represented an adjustment of the scale of this single variable for the sake of fitting the model accurately to the small cities of this sample.

RESULTS

PERIOD 1—For each city except one, crime rate figures were available from 1971 to 1974, and the linear regression slope was calculated for each city. The mean slope coefficient of 4.66 (standard deviation = 2.76) differed significantly from zero, indicating an increase in crime in the total sample of cities during these years (two-tailed \( t(21) = 7.93 \), \( p < .001 \)). In addition, each individual slope was positive, including the 1968–1971 slope for Mission Hills, which was used in this analysis and subsequent analyses. However, the 1971–1974 Mission Hills slope was −0.05, indicating a trend of decrease in crime rate from 1971 to 1974 after reaching one-percent TM program participation in early 1972. The Johnson County subsample also reflected a significantly increasing crime trend (\( M = 4.20, S.D. = 2.45 \), two-tailed \( t(10) = 5.70 \), \( p < .001 \)). All additional analyses employing slope scores are used for alternative hypotheses and are reported below.

PERIOD 2—Three cities had reached the criterion of one-percent participation in the TM program by July 31, 1975 (see table 3). As illustrated in figure 3, each of the one-percent cities decreased in crime during the following year: the decrease in crime among the group of one-percent cities was significant in contrast to the other cities in the sample (one-tailed \( t(21) = -4.15, p < .001 \)). The difference between the means of the two groups was approximately 30 percentage points (see figure 3). All three of the one-percent cities were in Johnson County, and the group of one-percent cities also decreased significantly in crime rate, in comparison with the other cities of this homogeneous area (one-tailed \( t(9) = -6.07, p < .001 \)), with a difference of 36 percentage points between the two means (see figure 4). All one-percent cities had a value of \( \delta \) larger than 0.21.

The correlation between percentage of TM participants and crime rate decrease was significant for both the whole sample of cities and the Johnson County subsample (\( r = -0.64 \), one-tailed \( t(21) = -3.82, p < .001; r = -0.87, t(9) = -5.29, p < .001 \), respectively). Similarly, the correlation between \( \delta \) and crime rate decrease was significant for both the entire sample and the Johnson County cities (\( r = -0.54 \), one-tailed \( t(21) = -2.97, p < .005; r = -0.86, t(9) = -5.12, p < .001 \), respectively).

PERIOD 3—By the end of 1975, four cities had reached the predicted threshold level of one-percent participation in the TM program (see table 3 and figure 5). These four cities each decreased in crime rate in 1976, and their mean decrease was significantly greater than the change in the other cities of the sample (one-tailed \( t(21) = -2.21, p < .025 \)). The difference between the two groups was approximately 14 percentage points (one-percent cities, \( M = -14.49, S.D. = 11.33 \); other cities, \( M = -0.47, S.D. = 11.56 \)). All four of the one-percent cities were in Johnson County, and these cities also decreased significantly in contrast to the other Johnson County cities (one-tailed \( t(9) = -2.81, p < .05 \), see figure 6). The mean change of the other Johnson County cities was 5.50 (\( S.D. = 11.37 \)).

Significant correlations were also found between percentage of TM participation and crime rate change during Period 3, for both the total sample and for the Johnson County cities (\( r = -0.50 \), one-tailed \( t(21) = -2.65, p < .01; r = -0.78 \), one-tailed \( t(9) = -3.47, p < .01 \), respectively). Similarly, the correlation between \( \delta \) and crime rate decrease was also significant in both the total group of cities and the Johnson County subsample (\( r = -0.39 \), one-tailed \( t(21) = -1.96, p < .05; r = -0.73 \), one-tailed \( t(9) = -3.24, p < .01 \)).

ALTERNATIVE HYPOTHESIS—In order to clarify the
### TABLE 3

**CRIME RATE CHANGE AND VALUES OF PERCENTAGE TM PARTICIPATION AND δ**

<table>
<thead>
<tr>
<th>CITY</th>
<th>PERIOD 2</th>
<th>PERIOD 3</th>
<th>PERIOD 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent Crime Rate Change</td>
<td>Percent TM Participation</td>
<td>δ</td>
</tr>
<tr>
<td>Belton</td>
<td>39.54</td>
<td>0.04</td>
<td>.02</td>
</tr>
<tr>
<td>Bonner Springs</td>
<td>12.74</td>
<td>0.00</td>
<td>.00</td>
</tr>
<tr>
<td>Fairway-Westwood</td>
<td>-12.84</td>
<td>1.11</td>
<td>.23</td>
</tr>
<tr>
<td>Gladstone</td>
<td>-1.87</td>
<td>0.14</td>
<td>.03</td>
</tr>
<tr>
<td>Grandview</td>
<td>13.49</td>
<td>0.11</td>
<td>.03</td>
</tr>
<tr>
<td>Independence</td>
<td>7.03</td>
<td>0.16</td>
<td>.03</td>
</tr>
<tr>
<td>Kansas City, KS</td>
<td>9.65</td>
<td>0.16</td>
<td>.03</td>
</tr>
<tr>
<td>Kansas City, MO</td>
<td>4.47</td>
<td>0.33</td>
<td>.02</td>
</tr>
<tr>
<td>Leawood</td>
<td>13.62</td>
<td>0.99</td>
<td>.20</td>
</tr>
<tr>
<td>Lee's Summit</td>
<td>2.09</td>
<td>0.22</td>
<td>.05</td>
</tr>
<tr>
<td>Leavena</td>
<td>32.98</td>
<td>0.32</td>
<td>.07</td>
</tr>
<tr>
<td>Liberty</td>
<td>0.79</td>
<td>0.39</td>
<td>.08</td>
</tr>
<tr>
<td>Merriam</td>
<td>17.47</td>
<td>0.53</td>
<td>.11</td>
</tr>
<tr>
<td>Mission-Countrywide</td>
<td>19.99</td>
<td>0.50</td>
<td>.10</td>
</tr>
<tr>
<td>Mission Hills</td>
<td>-30.03</td>
<td>2.92</td>
<td>.28</td>
</tr>
<tr>
<td>North Kansas City</td>
<td>11.15</td>
<td>0.06</td>
<td>.01</td>
</tr>
<tr>
<td>Gladstone</td>
<td>19.69</td>
<td>0.19</td>
<td>.04</td>
</tr>
<tr>
<td>Overland Park</td>
<td>4.91</td>
<td>0.51</td>
<td>.10</td>
</tr>
<tr>
<td>Prairie Village</td>
<td>-9.17</td>
<td>1.11</td>
<td>.22</td>
</tr>
<tr>
<td>Raytown</td>
<td>-11.06</td>
<td>0.20</td>
<td>.04</td>
</tr>
<tr>
<td>Roeland Park</td>
<td>24.41</td>
<td>0.39</td>
<td>.09</td>
</tr>
<tr>
<td>Shawnee</td>
<td>18.84</td>
<td>0.19</td>
<td>.04</td>
</tr>
<tr>
<td>Sugar Creek</td>
<td>15.58</td>
<td>0.04</td>
<td>.01</td>
</tr>
</tbody>
</table>

**ONE-OTHER CITIES**

![Diagram showing crime rate change for period 2 for cities in the Kansas City metropolitan area]

**CITIES WITH ONE-PERCENT TM PROGRAM PARTICIPATION**

<table>
<thead>
<tr>
<th>CITY NAME</th>
<th>% CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fairway-Westwood</td>
<td>-12.84</td>
</tr>
<tr>
<td>2. Mission Hills</td>
<td>-30.03</td>
</tr>
<tr>
<td>3. Prairie Village</td>
<td>-9.17</td>
</tr>
<tr>
<td>Average Change</td>
<td>-17.35</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>11.14</td>
</tr>
</tbody>
</table>

**OTHER CITIES**

<table>
<thead>
<tr>
<th>CITY</th>
<th>% CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Belton</td>
<td>39.54</td>
</tr>
<tr>
<td>5. Bonner Springs</td>
<td>12.74</td>
</tr>
<tr>
<td>6. Gladstone</td>
<td>-1.87</td>
</tr>
<tr>
<td>7. Grandview</td>
<td>13.49</td>
</tr>
<tr>
<td>8. Independence</td>
<td>7.03</td>
</tr>
<tr>
<td>9. Kansas City, KS</td>
<td>9.65</td>
</tr>
<tr>
<td>10. Kansas City, MO</td>
<td>4.47</td>
</tr>
<tr>
<td>11. Leawood</td>
<td>13.62</td>
</tr>
<tr>
<td>12. Lee's Summit</td>
<td>2.09</td>
</tr>
<tr>
<td>13. Leavena</td>
<td>32.98</td>
</tr>
<tr>
<td>14. Liberty</td>
<td>0.79</td>
</tr>
<tr>
<td>15. Merriam</td>
<td>17.47</td>
</tr>
<tr>
<td>17. North Kansas City</td>
<td>11.15</td>
</tr>
<tr>
<td>18. Olathe</td>
<td>19.69</td>
</tr>
<tr>
<td>19. Overland Park</td>
<td>-4.91</td>
</tr>
<tr>
<td>20. Raytown</td>
<td>-11.06</td>
</tr>
<tr>
<td>21. Roeland Park</td>
<td>24.41</td>
</tr>
<tr>
<td>22. Shawnee</td>
<td>18.84</td>
</tr>
<tr>
<td>23. Sugar Creek</td>
<td>15.58</td>
</tr>
<tr>
<td>Average Change</td>
<td>12.78</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>11.80</td>
</tr>
</tbody>
</table>

FIG. 3. PERCENT CRIME RATE CHANGE FOR PERIOD 2 FOR CITIES IN THE KANSAS CITY METROPOLITAN AREA
relationship between TM program participation and crime rate decrease, it is important to control for other demographic variables which may be interacting with or confounding this relationship, or which might be suggested as alternative causes of either crime rate decrease or TM program participation or both. In order to do so, correlations were calculated between a number of demographic variables and the two indices of TM program participation (percentage TM participation and $\delta$), to find predictors of TM program participation. These variables were then correlated with crime rate change in the absence of the TM program influence during baseline Period 1. In addition, partial correlations were run to assess the strength of association of the TM program and crime rate decrease in Periods 2 and 3 controlling for the contribution of these variables.

The following variables used in Study 1 were employed as predictors of the variable $\delta$: population, population density, percent unemployed, per capita income, percent below poverty level, percent in same residence after five years, percent over age 65, and median years of education. These were the variables which correlated with crime rate in Study 1 at the $p < .20$ probability level, and in addition per capita income, which was found by Hatchard (in press) to be associated in Cleveland suburbs with percentage of participants in the TM program. Each of these variables was taken from 1970 census data except for population and density, which were available for both 1975 and 1976, and per capita income, available for 1974 and 1975. In addition, the percentage of persons in the age ranges 10–29 and 5–19 were taken from 1970 census data as possible predictors.

Table 4 lists those demographic variables which correlated significantly ($p < .05$) with the indices of TM program participation for Periods 2 and 3. It indicates that cities of this sample with a high influence of the TM program were characterized by higher education and income, stable residency, fewer families with income below the poverty level, and

![Graph showing percent crime rate change for Period 2 for cities in the Johnson County subsection of the Kansas City metropolitan area.](image)

3. Population and city area figures were obtained from the city offices. The Census Bureau provided 1975 and revised 1974 per capita income estimates prior to official publication. In addition, the number of policemen in each city for 1975 and 1976 was obtained from the city police departments.
FIG. 5. PERCENT CRIME RATE CHANGE IN PERIOD 3 FOR CITIES IN THE KANSAS CITY METROPOLITAN AREA

III ONE-PERCENT CITIES
CITY NAME % CHANGE
1. Fairway-Westwood - 7.24
2. Leawood - 5.66
3. Mission Hills - 30.44
4. Prairie Village - 14.61
Average Change - 14.49
Standard Deviation 11.33

III OTHER CITIES
5. Belton 14.41
6. Bonner Springs 8.31
7. Gladstone 18.04
8. Grandview 1.50
9. Independence - 11.14
10. Kansas City, KS - 0.34
11. Kansas City, MO - 2.91
12. Lee's Summit - 6.68
13. Lenexa 21.00
14. Liberty - 11.14
15. Merriam 8.97
16. Mission-Countryside 7.46
17. North Kansas City - 7.38
18. Olathe 4.36
19. Overland Park - 4.26
20. Raytown - 20.50
21. Roeland Park 19.33
22. Shawnee 0.39
23. Sugar Creek 6.39
Average Change - 0.47
Standard Deviation 11.36

FIG. 6. PERCENT CRIME RATE CHANGE IN PERIOD 3 FOR CITIES IN THE JOHNSON COUNTY SUBSECTION OF THE KANSAS CITY METROPOLITAN AREA

III ONE-PERCENT CITIES
CITY NAME % CHANGE
1. Fairway-Westwood - 7.24
2. Leawood - 5.66
3. Mission Hills - 30.44
4. Prairie Village - 14.61
Average Change - 14.49
Standard Deviation 11.33

III OTHER CITIES
5. Lenexa 21.00
6. Merriam 8.97
7. Mission-Countryside 7.46
8. Olathe 4.36
9. Overland Park - 4.26
10. Roeland Park 19.33
11. Shawnee 0.39
Average Change 5.50
Standard Deviation 11.37
fewer children between the ages of 10 and 29 (in 1970). Per capita income and median years education may be considered a single predictor, correlating .95 in 1970 in this sample.

In order to determine whether these predictors of the influence of the TM program predict crime rate in the absence of the predicted effect of the TM program, these variables were correlated with the slope score for Period 1, which measured the trend of crime from 1971 to 1974. Table 5 lists these correlations along with the correlation of these variables with the crime rate changes of Periods 2 and 3. As indicated by inspection of table 5, the correlations for education, stable residency, and per capita income are significant during Periods 2 and 3, but not in Period 1 in which there is no predicted effect of the TM program. In addition, the only one of these variables for which change data are available, per capita income, indicates that the percent change in income was not related to crime rate change during any of the periods.

Finally, partial correlations were calculated to determine the degree of correlation between percentage TM participation and crime rate change, and between δ and crime rate change, controlling for those demographic variables which predict the influence of the TM program. Table 6 lists the first-order partial correlations for these variables both for the entire sample of cities and for the Johnson County subsample during Periods 2 and 3.

Inspection of table 6 indicates that the partial correlations between crime rate decreases and the percentage of TM program participants were uniformly significant when controlling for stable residency, families in poverty, and percent from ages 10–29 in 1970, but not all significant when controlling for 1970 values of education and per capita income. An exception was the Johnson County subsample in Period 2 for the variable δ, in which each of the partial correlations was significant. In general, however, the results for the variable δ were not as strong as for the variable of percentage of TM program participants; in addition, the correlations were consistently stronger in the affluent and socioeconomically homogeneous Johnson County area. The positive partial correlation for Period 3 in the total sample, controlling for per capita income, is a spurious result of the high collinearity between per capita income and percentage TM participation in 1975 (r = .97).

Given that prior levels of median years education

---

**Table 4**

<table>
<thead>
<tr>
<th>PREDICTOR VARIABLES</th>
<th>CORRELATION WITH δ</th>
<th>PERIOD 2</th>
<th>PERIOD 3</th>
<th>CORRELATION WITH PERCENTAGE TM PARTICIPATION</th>
<th>PERIOD 2</th>
<th>PERIOD 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per Capita Income (1975)</td>
<td>.804**</td>
<td>.790**</td>
<td>.968**</td>
<td>.968**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median Years Education (1970)</td>
<td>.842**</td>
<td>.833**</td>
<td>.941**</td>
<td>.945**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent in Ages 10–29 (1970)</td>
<td>.585**</td>
<td>-.586**</td>
<td>-.571**</td>
<td>-.582**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent in Same Residence After Five Years (1970)</td>
<td>.475*</td>
<td>.464*</td>
<td>.484*</td>
<td>.472*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of Families Below Poverty Level (1970)</td>
<td>-.509*</td>
<td>-.528*</td>
<td>-.408</td>
<td>-.419*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < .05  ** p < .01 (two-tailed)

**Table 5**

<table>
<thead>
<tr>
<th>PREDICTOR VARIABLES</th>
<th>CORRELATION WITH CRIME RATE CHANGE</th>
<th>PERIOD 1</th>
<th>PERIOD 2</th>
<th>PERIOD 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Years Education (1970)</td>
<td>-.322</td>
<td>-.562**</td>
<td>-.457*</td>
<td></td>
</tr>
<tr>
<td>Percent in Ages 10–29 (1970)</td>
<td>.277</td>
<td>.293</td>
<td>.165</td>
<td></td>
</tr>
<tr>
<td>Percent Families in Poverty (1970)</td>
<td>.083</td>
<td>.325</td>
<td>.296</td>
<td></td>
</tr>
<tr>
<td>Percent in Same Residence After Five Years (1970)</td>
<td>-.104</td>
<td>-.664**</td>
<td>-.471*</td>
<td></td>
</tr>
<tr>
<td>Per Capita Income (1970)</td>
<td>-.272</td>
<td>. . .</td>
<td>. . .</td>
<td></td>
</tr>
<tr>
<td>Per Capita Income (1975)</td>
<td>. . .</td>
<td>-.614**</td>
<td>-.538**</td>
<td></td>
</tr>
<tr>
<td>Percent Change of Per Capita Income (1974–1975)</td>
<td>. . .</td>
<td>-.235</td>
<td>-.077</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05  ** p < .01 (two-tailed)
and per capita income (1970 and 1975, respectively) predict in this sample both the TM program influence and crime rate decrease, it is important to determine whether change in these variables during Periods 2 and 3 predict crime rate changes during these periods. Change data were available only for the income variable and not the education variable, but since these two variables correlated .95 in 1970, inferences from one variable may be extended to the other. As indicated by Table 6, the correlation between each index of TM program participation and crime rate change for Periods 2 and 3 was significant when controlling for percentage change in per capita income from 1974 to 1975.

Table 6 also lists partial correlations between each of the two indices of TM program participation and crime rate change in Periods 2 and 3 when controlling for the following variables for which change data were available during those periods: change in Period 1 crime trend for each city; and percentage change in population, population density, and police coverage (population per policeman). Each of these partial correlations was significant for both the total sample and the Johnson County subsample, except for the variable \( \delta \) in the total sample in Period 2, for which two of the variables only approached significance. This indicates that none of these variables is a viable alternative hypothesis for crime rate changes found in this study associated with the practice of the Transcendental Meditation program.

**DISCUSSION**

The probability model adopted here, based on Maharishi’s principles of collective consciousness, appears empirically useful in predicting the existing level of crime rate, crime rate growth, and crime rate decrease. In each of these three aspects of prediction employing the model, specification of a source of disorderly or orderly influence was required. The sources hypothesized in the respective studies were: the population of a city as a source of disorderly influence predictive of crime rate level; the repeated influence of a population over time as a source of disorderly influence in predicting crime rate growth; and practice of the Transcendental Meditation program as a source of orderly influence in predicting crime rate decrease.

In Study 1, the population of a city was transformed into the variable \( P_i \), which was found to be clearly the most effective of the ten predictors of crime rate differences between the 108 cities sampled in 1970. The relative contribution of this transformation by the probability model is indicated
by the fact that the variable \( P_i \) predicted three times as much crime rate variance (36%) as the raw population upon which it was based. The relative stability of this level of prediction and the relative contribution of other demographic variables to crime rate prediction are obvious directions for replication.

In operationalizing the variable \( P_i \) in Study 2, time was hypothesized as a source of disorder in a given stable population. This hypothesis led to quite accurate prediction of recorded U.S. crime rate growth from 1960 to 1970 as well as prediction back to the first half of the century. However, the difficulties in discriminating between alternative growth models in this largely monotonically increasing series are compounded by the few degrees of freedom and concerns about the changing accuracy of recorded crime rate data.

Study 3 turned to the most practical implication of crime rate prediction, the prediction of crime rate decrease. It was hypothesized that a function of the percentage of participants in the Transcendental Meditation program in a city would predict increased social order, reflected in crime rate decrease. This hypothesis was supported for two time periods between 1974 and 1976 among cities of the Kansas City metropolitan area.

In order to determine whether variations in crime rate and the indices of TM program influence (percentage of TM participants or the variable \( \delta \)) were both the result of variations in another demographic variable, the crime predictors of Study 1 were used as predictors of TM program participation. Among the variables which predicted TM program participation with some accuracy, static values of median years education (1970) and per capita income (1975) appear at first glance as candidates for an alternative cause of the crime rate changes of Periods 2 and 3 of Study 3; when each of these variables was partialled out, the correlation between TM program participation and crime rate change was not significant for the total sample of cities.

However, several lines of evidence indicate that these two variables were not the causes of the crime rate changes of Periods 2 and 3. The first is that the existing 1970 values of these variables did not significantly correlate with crime rate trend in Period 1, before the hypothesized influence of the TM program; nor did percent change in per capita income over Period 1 predict crime rate trend of that period.

The second line of evidence is that control for percent change in per capita income during Periods 2 and 3 did not significantly reduce the correlation between TM program participation and crime rate change. Finally, the relationship between TM program participation and crime rate change was stronger rather than weaker in the Johnson County suburban subsample of cities, which are characterized by relatively homogeneous high levels of income and education.

A long series of high-order partial correlations of various degrees could be attempted to locate some combination of demographic variables which might predict the crime rate changes of Study 3. Yet given the small number of degrees of freedom of the sample, the probability of chance correlations in such a series, and the lack of any heuristic framework for directing such a search, it is much more parsimonious to interpret the results of Study 3 as consistent with earlier studies in support of the hypothesis that participation in the TM program is predictive of increased social order, as reflected in crime rate reduction.

A final point in regard to Study 3 is the comparison of the effectiveness for predicting crime rate decrease of: 1) the variable \( \delta \) generated by the probability model and 2) the variable of percentage of TM program participants used in prior studies. The compound probability model was useful in operationalizing Maharishi's principles of collective consciousness to predict existing cross-sectional crime rate variation and crime rate change over time. However, in terms of the magnitude of the raw and partial correlations, the percentage of TM program participants was consistently superior. In addition, in all three periods of Study 3, this variable exactly defined a threshold (one percent) beyond which all cities decreased in crime rate. All cities with more than one percent TM program participation also had values of \( \delta \) larger than 0.21 and thus discrimination between the two variables on the basis of threshold effects was not possible. The one-percent threshold, predicted specifically by Maharishi, is also consistent with the results of previous research (Borland and Landrith, 1977). However, the compound probability model does not contain any basis for predicting threshold effects. Therefore, it is recommended that future research on the Maharishi Effect should use percentage of TM program participants.

The most important practical implication of this
research is that the Transcendental Meditation program, through the field effects of consciousness found in this study and other research, is a practical and efficient technology through which the quality of life of a society may be enriched.

ACKNOWLEDGMENTS

I am grateful to Terry Bauer, Doug Kay, Thomas Payne, J. D., and Susan Vida for their assistance in collecting much of the data for these studies.

APPENDIX A

DERIVATION OF EQUATIONS IN TEXT

The effect of one unit \( x \) of disorderly influence on \( P(g|h) \) is derivable from the theorem of compound probability, which states:

\[
P(ABC) = P(A) P(B|A) P(C|AB).
\]

Therefore,

\[
P(hgx) = P(h)P(g|h)P(x|gh),
\]

and

\[
P(hgx) = P(h)P(x|h)P(g|hx),
\]

so

\[
P(g|hx)P(x|h) = P(x|gh)P(g|h),
\]

and thus

\[
P(g|hx) = \frac{P(x|gh)}{P(x|h)} P(g|h). \tag{a}
\]

Because of equation (a), we have also

\[
P(\bar{g}|hx) = \frac{P(x|\bar{g}h)}{P(x|h)} P(\bar{g}|h). \tag{b}
\]

Since

\[
P(g|hx) + P(\bar{g}|hx) = 1,
\]

we have

\[
P(g|hx) = \frac{P(g|hx)}{P(g|hx) + P(\bar{g}|hx)} \tag{c}
\]

and, by substitution of equations (a) and (b) in equation (c) and appropriate algebraic manipulation,

\[
P(g|hx) = \frac{\frac{P(x|gh)}{P(x|h)} P(g|h)}{\frac{P(x|gh)}{P(x|h)} P(g|h) + \frac{P(x|\bar{g}h)}{P(x|h)} P(\bar{g}|h)}
\]

That is, equation (d) is applied, letting \( h \) in (d) stand for the new level of disorder \( hx_1 \). By substitution of \( P(g|hx_1) \) as defined by equation (e), and by appropriate algebraic simplification, equation (f) becomes

\[
P_1 = \frac{R_1 P(g|h)}{R_1 P(g|h) + (1 - P(g|h))}, \tag{f}
\]

where

\[
R_1 = R = \frac{P(x|gh)}{P(x|\bar{g}h)}.
\]

From equation (d) we can also write

\[
P_2 = P(g|hx_2)
\]

\[
= \frac{R_2 P(g|hx_1)}{R_2 P(g|hx_1) + (1 - P(g|hx_1))}.
\]
This process can be extended to give, for \( i \) units of disorderly influence:

\[
P_1 = \frac{R_i R_i R_0}{R_i R_i R_0 + (I - P_0)}.
\]

To simplify this equation and remove an extra source of nonlinearity, let us assume that:

\[
R_1 = R_2 = \ldots = R_1.
\]

In this case, equation (g) becomes

\[
P = \frac{R_i P_0}{R_i P_0 + (I - P_0)},
\]

where, for simplicity,

\[
R_i = R = \frac{P(\xi|\xi|gh)}{P(\xi|\xi|gh)}.
\]

In order to derive the effect on \( P(\xi|\xi|h) \) of one unit of orderly influence, \( x \), we have, from equation (a),

\[
P(\xi|\xi|h) = \frac{P(\xi|\xi|h)}{P(\xi|h)} P(\xi|h),
\]

and

\[
P(\xi|h) = \frac{P(\xi|h)}{P(\xi|h)} P(\xi|h).
\]

Again,

\[
P(\xi|h) = \frac{P(\xi|h)}{P(\xi|h) + P(\xi|h)}.
\]

After substitution of equations (h) and (i) in equations (j) and simplification parallel to that which gave equation (d), we have:

\[
P(\xi|h) = \frac{P(\xi|h)}{P(\xi|h) + P(\xi|h) P(\xi|h)}
\]

\[
= \frac{P(\xi|h)}{P(\xi|h) + S(I - P(\xi|h))}
\]

\[
= \frac{P_0}{P_0 + S(I - P_0)},
\]

where \( P(\xi|h) = I - P(\xi|h) \), \( P_0 = P(\xi|h) \), and

\[
S = \frac{P(\xi|h)}{P(\xi|h)}.
\]

In order to show the progressive effect of \( j \) units of \( \xi \), the following equation is derived from equation (k) by repeated substitution in the same manner that equation (g) was derived:

\[
P = \frac{P_0}{P_0 + S(I - P_0)},
\]

where \( S_j \) corresponds to \( S_j \), etc., and \( P_0 \) is \( P(\xi|h) \), the probability of \( g \) prior to \( \xi \). Again, assuming that \( S_1 = S_2 = \ldots = S_j \), this equation condenses to:

\[
P = \frac{P_0}{P_0 + S(I - P_0)}.
\]

REFERENCES


LEVINE, P. 1976. The coherence spectral array (COSPAR) and its application to the study of spatial ordering in the