A reduction in crime was found in the Union Territory of Delhi, India over a five-month period as a result of the collective practice of the Transcendental Meditation and TM-Sidhi programme.

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This study tests the prediction that when the number of individuals participating together in the TM-Sidhi program exceeds the square root of one percent of a society an influence of coherence is created in the collective consciousness of the entire society, resulting in decreased crime. The hypothesis is tested during a course held in New Delhi, India, from November 1980 to April 1981, during which time the number of TM-Sidhi participants was greater than the required total for the Union Territory of Delhi. This quasi-experimental intervention study assessed changes in daily crime totals in the state of Delhi from 1 June 1980 to 31 March 1981. Intervention analysis using ARIMA time series methodology indicated a highly significant decrease of 14.6 crimes per day (11.0 percent) during the intervention period. The implication of these findings for governmental policy is discussed; it is suggested that the adoption of the Transcendental Meditation and TM-Sidhi program in educational settings is a practical means to improve the quality of social as well as individual life.

INTRODUCTION

A number of recent studies give evidence that a small proportion of individuals in a society practicing the Transcendental Meditation and TM-Sidhi program results in an increased coherence in the behavior of the whole society, as reflected in such measures as decreased crime rate. This research consistently indicates that as few as one percent of a city's population practicing the Transcendental Meditation (TM) technique results in decreased crime rate in the city, a phenomenon referred to as the Maharishi Effect after Maharishi Mahesh Yogi, the founder of the TM technique (Borland and Landrith, 1977; Dillbeck, in press; Dillbeck, Landrith, and Orme-Johnson, 1981; Hatchard, in press). The use of causal modeling techniques in studies of random samples of cities and metropolitan areas gives further evidence that the TM program is the causal factor in this crime rate decrease (Dillbeck, Landrith, Polanzi, and Baker, in press).

The same effect has been found at the state and national levels for even a smaller proportion of individuals practicing the more advanced TM-Sidhi program (Burgmans, Van der Burgt, Langenkamp, and
Verstegen, in press; Dillbeck, Foss, and Zimmermann, in press). These studies indicate that as few as the square root of one percent of the population of a social group participating in the group practice of the TM-Sidhi program, termed the "group dynamics of consciousness," is sufficient to create an influence of coherence in the whole society.

The principles by which such phenomena are predicted to occur have been outlined by Maharishi (1977). Each level of society—family, city, state or province, nation, and the world as a whole—has its own level of collective consciousness. Collective consciousness is the consciousness of the whole social group; the quality of collective consciousness is based on the quality of consciousness of each individual of the group, yet collective consciousness has its own integral character or wholeness that is more than simply the consciousness of all the individuals of the group. Collective consciousness and individual consciousness are said to have a reciprocal relationship in that collective consciousness is determined by the individuals in society yet it in turn influences each member of society.

The fundamental characteristic of collective consciousness which determines the quality of life in society is the degree of coherence of the collective consciousness. In a society in which collective consciousness is highly coherent individual needs and the needs of society are integrated; lack of coherence is reflected in conflict between individual desires and actions and the goals of society. The less the coherence in the collective consciousness of society, the more the cohesive fabric of society is disrupted. Crime, turbulence, and other indicators of social disharmony are seen as expressions of lack of coherence in the collective consciousness of the society.

Maharishi defines the source of disorder in collective consciousness and suffering in general as the violation of the laws of nature which govern human life. Because the range and diversity of these laws are so great, beyond the scope of present social science to describe in detail, it is not possible for the individual to determine appropriate behavior through an intellectual analysis of the vast range of factors interacting in each situation. For this reason, the only way in which human life can be raised to a level at which violation of natural law will not occur is to establish the individual's awareness in the unified field of all the laws of nature, identified by Maharishi as the field of pure consciousness. It is this field of pure consciousness which is experienced during the Transcendental Meditation technique, and which is further enlivened in individual awareness and in collective consciousness through the TM-Sidhi program. Because the unified field of natural law maintains the coherence and governs the evolution of all expressed levels of nature, action does not violate any aspect of the laws of nature governing the evolution of life when one's consciousness is established in that field.

It is because of the fundamental nature of consciousness as the unified field of natural law that even a small number of individuals can have an effect on the collective consciousness of the whole society through the Transcendental Meditation and TM-Sidhi program. Quantum field theory in modern physics describes all the fundamental forces and elements of nature as being fields, unlocalized in space. According to Maharishi, pure consciousness, identical to the unified field of natural law being described mathematically by quantum field theory, can also be identified as a field. For this reason, the influence of coherence that is created through contacting the unified field of natural law is propagated throughout the field, influencing all others in the environment.

Quantum physics has also found that the influence of even a few coherent elements in a large system can lead to a phase transition in which the whole system functions coherently. This is the case, for example, in laser light. The intensity of light generated by coherent photons is proportional to the square of their number, while that of incoherent photons is proportional only to their number. As a result, the behavior of a small group of coherent photons (proportional to the square root of the total number) can balance the disorderly influence of a much larger number of incoherent photons, resulting in the macroscopic coherence of a beam of laser light. The similarity of this phenomenon, termed superradiance in the case of laser light, to the increased coherence found in society when as few as the square root of one percent of the society participate in the group practice of the TM-Sidhi program, has resulted in this social phenomenon being called the Super Radiance Effect.

The purpose of the present study is to test the prediction that the group practice of the TM-Sidhi program would result in the decrease in crime in an
entire state when a sufficient number are practicing in the group. The opportunity for this study came when Maharishi offered a course on Vedic Science in New Delhi, India, in November 1980. Vedic Science describes the full range of natural law and its relationship to human consciousness, and offers a subjective technology, the Maharishi Technology of the Unified Field, the Transcendental Meditation and TM-Sidhi program, to directly experience the unified field of natural law as pure consciousness. According to the principles outlined above, a sufficient number of people attended and participated in the group dynamics of consciousness at the course to have an influence on the entire Union Territory (state) of Delhi. This study investigates this intervention using time series analysis of daily crime data.

METHOD

SAMPLE—The Vedic Science course in New Delhi, India, began on 6 November 1980. It had originally been planned that the course should last for one month. It was subsequently decided, however, to extend the course for those students who were able to stay for a longer period. Approximately 3,000 participants in the Transcendental Meditation and TM-Sidhi program were present for the first month of the course; the number present decreased gradually after a large group left at the end of the first month, until, when the course ended in early April, approximately 250 were still present. The Union Territory of Delhi, India, had a population of 6,000,000 at this time, and thus a group of 245, the square root of one percent, would theoretically be necessary to influence the entire state. An effect on the crime totals in the state of Delhi could therefore be predicted throughout the period of the Vedic Science course.

PROCEDURE—Daily crime totals for the Union Territory of Delhi were obtained from the Delhi Police Headquarters for the months June 1980 through March 1981, a series comprising 304 observations. Crime totals were those reported according to the Indian Penal Code (IPC), consisting of the following categories: murder, attempted murder, robbery, riot, dacoity (violent crimes committed by roving bands), burglary, snatching, injury, motor vehicle theft, cycle theft, miscellaneous theft, and miscellaneous IPC crimes (e.g., nongrievous injury). Daily totals rather than rates served as the dependent (endogenous) variable because changes in population were not available on a daily basis.

The period 1 June 1980 to 5 November 1980 (158 observations) served as the pre-intervention or baseline period, and the intervention period was 6 November 1980 to 31 March 1981 (146 observations). There was not a clear theoretical prediction as to whether the influence of coherence over the predicted threshold during the early part of the intervention period, when the number of TM-Sidhi participants was greater, would be more intense locally or would be consistent in magnitude locally but spread over a larger geographical area. For this reason, the intervention period was modeled as a single homogeneous intervention rather than as an intervention decreasing by some function.

RESULTS

The intervention assessment model tested here is the “zero order” transfer function model \( Y_t = \omega_0 I_t + N_t \), where \( Y_t \) is the observed time series (daily crime totals), \( I_t \) is an intervention step function which is zero prior to the intervention and one during the intervention, \( \omega_0 \) is the intervention parameter to be estimated, and \( N_t \) is a stochastic “noise component” to be modeled by autoregressive integrated moving average (ARIMA) model (Box and Jenkins, 1976; McCleary and Hay, 1980; Tiao, Box, and Hamming, 1975). The noise component serves as the null case in the intervention analysis.

The first step in analysis is the construction of an ARIMA model for \( N_t \) from the pre-intervention time series based on the autocorrelation and partial autocorrelation structure of the time series. The model for \( N_t \) was somewhat complex. It included an autoregressive component parameter with the first and second order as well as the seventh order (weekly seasonality). In addition, an apparent monthly (31 day) seasonality was also found, which was modeled by a multiplicative first order autoregressive seasonal component. Thus, the model identified for \( N_t \) was ARIMA \((7,0,0)(1,0,0)_3\):

\[
N_t = (1 - \Gamma B^3)^{-1} (1 - \phi_1 B - \phi_2 B^2 - \phi_7 B^7)^{-1} \omega_t + c,
\]

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2. The assistance of Mr. P. S. Bhinder, Commissioner of Police, and Mr. A. K. Agrawal, Deputy Commissioner of Police of the Delhi Police Headquarters, is gratefully acknowledged for the collection of this data.
where $B^0Y_t = Y_{t-n}$, $\Gamma_1$ is a seasonal autoregressive parameter, $\phi_i$ are autoregressive parameters, $c$ is a constant, and $a_t$ is a series of independent and identically distributed random disturbances.

This model was able to successfully transform the pre-intervention series into a random disturbance around a constant value, thus removing any predictable ARIMA structure within the series. It is the presence of such a serial dependence among the raw series which makes ordinary parametric methods that assume independent (uncorrelated) observations inappropriate for such data (Box and Tiao, 1975; Tiao, Box, and Hamming, 1975). The identification of this serial correlation structure allows it to be removed when the full intervention model is fitted, yielding accurate estimation of the intervention parameter.

The next step in analysis was the joint estimation of the intervention component ($\omega_0 t_i$) and noise model ($N_t$) for the full data set of 304 observations. The fit of the overall model was highly significant, $R^2 = .349$, (adjusted $R^2 = .338$), $F(5, 260) = 27.907$, $p < .0001$. Diagnostic tests of the residuals of the

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>ESTIMATE</th>
<th>STANDARD ERROR</th>
<th>t(260)</th>
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<tbody>
<tr>
<td>Intervention ($\omega_0$)</td>
<td>-14.647</td>
<td>2.8605</td>
<td>-5.12***</td>
</tr>
<tr>
<td>One day autoregressive ($\phi_1$)</td>
<td>0.1556</td>
<td>0.0615</td>
<td>2.53**</td>
</tr>
<tr>
<td>Two day autoregressive ($\phi_2$)</td>
<td>0.08981</td>
<td>0.0612</td>
<td>1.47</td>
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<tr>
<td>Weekly autoregressive ($c_1$)</td>
<td>0.16015</td>
<td>0.0627</td>
<td>2.66**</td>
</tr>
<tr>
<td>Monthly (31 day) seasonal autoregressive ($\Gamma_1$)</td>
<td>-0.14071</td>
<td>0.0615</td>
<td>-2.29*</td>
</tr>
<tr>
<td>Constant term (mean of series)</td>
<td>137.3849</td>
<td>2.0988</td>
<td>65.46***</td>
</tr>
</tbody>
</table>

* $p < .05$  ** $p < .01$  *** $p < .0001$

![Figure 1. Weekly Crime Totals for the Union Territory of Delhi during the Baseline Period (1 June to 5 Nov. 1980) and Intervention Period (6 Nov. 1980 to 31 March 1981)](image-url)
model are also satisfactory. The residual autocorrelations are consistent with the null hypothesis of a serially independent "white noise" disturbance term, with only 1 of 60 autocorrelations significant at the .05 level, \( r_{30} = .132, z = 2.04, p = .02 \); this number would be expected by chance at the .05 significance level. Similarly, the Ljung-Box test for the joint significance of observed residual autocorrelations (Ljung and Box, 1978) yields the \( Q \) statistic \( Q(36) = 26.1 \) for autocorrelations 1 through 36; this is distributed approximately as chi-square with 32 degrees of freedom, \( p = .759 \). The corresponding \( Q \) statistic for autocorrelations 1 through 60 is \( Q(60) = 46.3 \), 56 degrees of freedom, \( p = .820 \). Thus, the null hypothesis of white noise random disturbances cannot be rejected at the usual levels of significance.

The parameter estimates and their corresponding \( t \)-statistic values are listed in table 1. The intervention parameter was \(-14.647, t(260) = -5.12, p < .0001 \). This means that the reported crime was on the average 14.65 crimes per day less during the intervention period than during the pre-intervention period. This represents a reduction of 11.0 percent from the pre-intervention average of 136.34 reported crimes per day (see figure 1). The size and statistical significance of the intervention parameter proved to be highly robust to alternative specifications of the noise model.

**DISCUSSION**

A highly significant decrease in crime totals during the five-month period of the Vedic Science course was found in the Union Territory of Delhi, India. The time series intervention analysis used here indicates that this decrease cannot be accounted for by factors inherent in the structure of the daily series of crime data prior to the Vedic Science course.

One other category of alternative hypothesis which must also be considered is the possibility that the decrease found here is due to some change in police procedures or due to some longer-term seasonality. One example is that changes in governmental policies of detention of habitual criminals, associated with changes in national administration, were reported by police to affect the monthly totals of IPC crimes in Delhi, as elsewhere. Such changes occurred at the transitions of national leadership from Prime Minister Gandhi to Prime Minister Desai and back, in April 1977 and in early 1980. However, these changes had stabilized by the beginning of this study.

A detailed examination of possible confounding influences due to police procedures was made by an Indian police official in the context of a preliminary examination of crime changes associated with the Vedic Science course in New Delhi (Rana, 1981). He found that there were no changes in local police policy, no special "drives" on crime, no systematic transfer of police staff, and no apparent changes in the number of criminals through externment or court clearance. Rana also found no seasonal variations due to time of year in previous years which would be associated with the beginning of the Vedic Science course. We also found that, in spite of the changes associated with governmental administration, the monthly means for the periods July to October and November to January, averaged over the years 1976 to January 1980, differed by less than one percent.

Rana (1981) notes that the only possible confounding factor during the intervention period was the passage of a National Security Ordinance which took effect beginning in October 1980, allowing the detainment of habitual criminals under some circumstances. Unlike the changes in detention procedures reported above, this act was not associated with a change in the national administration. This act does not account for the magnitude of change found in this study. Rana's analysis of the number of criminals actually detained in Delhi during this period indicated that at most one-third of the decrease found here could reasonably be attributed to the detainment of criminals. Moreover, the newspaper reports indicate that slightly less than half of the detainments reported by Rana (1981) were still in effect several months later, indicating that the effect of the National Security Ordinance over the whole intervention period is probably not as strong as the one-third estimate. He also notes that at the end of the Vedic Science course in April, heinous crimes in Delhi returned to their former level, even though the National Security Ordinance was still in effect. Heinous crimes are a subcategory of IPC crimes; this category consists of violent crimes and includes dacoity, which is primarily an offense involving habitual criminals.

In conclusion, the decrease in crime rate in the

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3. Indian Express News Service, New Delhi, 6 April 1981.
Union Territory of Delhi associated with the beginning of the Vedic Science course is most reasonably attributed to the course itself. This is consistent with prior research which indicates an increase in the coherence of collective consciousness from the group practice of the TM-Sidhi program. The fact that such interventions are possible in the collective functioning of society from as few as the square root of one percent of the population, and the fact that these effects do not involve any reductions in individual liberties or changes in social or political structure makes this technology for the improvement of society practical for any country on the state or even national level.

In light of the already widely-demonstrated effects of the Transcendental Meditation and TM-Sidhi program for the improvement of individual life on the physiological, psychological, and social levels (Orme-Johnson and Farrow, 1977; Chalmers, Clements, Schenkluhn, and Weinless, in press), it is proposed that this program be adopted by governments for the educational system of the state or nation; in this way a sufficient number of individuals may be easily trained so that the required threshold for creating coherence in the collective consciousness of the whole society is reached. Since the educational system is structured for the implementation of knowledge which will improve the quality of individual and social life, this will allow the educational system to achieve its aims while simultaneously creating an influence of coherence in the society to which it is responsible.

REFERENCES


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