A TIME SERIES ANALYSIS OF THE EFFECT OF THE MAHARISHI TECHNOLOGY OF THE UNIFIED FIELD: REDUCTION OF TRAFFIC FATALITIES IN THE UNITED STATES

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The collective practice of the Maharishi Technology of the Unified Field by a group numbering the square root of one percent of the population of the U.S.A. was found to result in decreases in national traffic fatalities.—EDITORS

This study assessed the influence of the group practice of the Maharishi Technology of the Unified Field on nationwide traffic fatalities in the United States during 1982. A substantial body of previous research indicates that as few as the square root of one percent of a population participating in the group practice of this program is sufficient to improve the quality of life in the entire society. A time series analysis of 1982 daily U.S. traffic fatality totals, adjusted for yearly trends based on 1975–1981 daily totals, was performed. It was found that a significant decrease in national traffic fatalities occurred immediately after the number collectively participating in this technology at Maharishi International University reached a high level, in excess of the number predicted to be necessary. The decrease in national traffic fatalities was also greater following days on which there was, in addition, a substantial increase in the number participating in the technology. These effects indicate the practicality of improving the national quality of life through the Maharishi Technology of the Unified Field.

INTRODUCTION

The purpose of this study was to investigate the effectiveness of the Maharishi Technology of the Unified Field in reducing national traffic fatalities in the United States. The Maharishi Technology of the Unified Field is predicted to have a holistic effect in improving the quality of life in society; traffic fatalities were chosen here as an indicator of quality of life because of the importance of traffic fatalities as a public health concern and because daily totals were available for rigorous time series analysis.

Accidents are the third most prevalent cause of death in the U.S., after cardiovascular disease and malignant disease. Traffic fatalities, in turn, account for the largest category of accidental deaths (almost 53,000 deaths in 1980), and thus constitute a major problem to public health.

Detailed theoretical consideration of the relationship between the Maharishi Technology of the Unified Field and traffic fatalities clearly indicates the uniqueness of this approach to improving the quality of life in society. According to Maharishi Mahesh Yogi, founder of the Maharishi Technology of the Unified Field, all social problems result from the violation of the laws of nature by citizens of the society.

In the case of motor vehicle or traffic fatalities, it is acknowledged that behaviors that result in decreased ability to attend and react effectively to the environment are leading causes of fatalities (e.g., fatigue or alcohol consumption). Such behaviors can clearly be
said to disrupt the balanced functioning of the laws of nature responsible for alertness and effective motor performance in the physiology.

Although contemporary physiology and psychology have identified some of the laws of nature responsible for effective behavior, it is clear that what has been understood so far is but a very small fraction of all that there is to know. Moreover, as indicated by the example above, even the understanding of these laws is insufficient to ensure that behavior will always be fully in accordance with the natural laws that support health. Previous attempts to educate citizens either to drive more safely or to avoid alcohol consumption when driving have been severely limited in their success; the mere knowledge of appropriate behavior does not guarantee that behavior. A second limitation of current preventive programs to reduce traffic fatalities is that they depend on communicating with individuals directly. This task has been substantially aided by the methods of mass communication, but effectiveness is nevertheless still very low.

Based upon these considerations, it can be concluded that the most effective means for prevention of traffic fatalities would be one that reached all members of society and, more importantly, allowed individuals to spontaneously behave in such a way that none of the laws of nature governing effective and life-supporting behavior were violated or ignored. The Maharishi Technology of the Unified Field has been described as having precisely these effects, and thus could be predicted to be an extremely effective means of prevention of traffic fatalities. The effect of this technology on each of these two factors will now be examined, starting with a consideration of its ability to foster spontaneously effective behavior and then addressing its effectiveness in terms of communication.

The Maharishi Technology of the Unified Field is predicted to culture a style of functioning of awareness that allows the individual to behave spontaneously in accordance with all the laws of nature, resulting in action that is life-supporting and free from mistakes. A consideration of how this is possible must address the relationship between individual awareness and the unified field of all the laws of nature.

The unified field of natural law has recently been mathematically described by the most recent formulation of extended supergravity theory of quantum physics (De Wit and Nicolai, 1982; Cremmer and Julia, 1978 and 1979; Ellis, 1983). These recent advances in quantum field theory indicate that as one probes increasingly finer scales of time and distance in nature, a sequential unification of the laws of nature takes place. At the finest time and distance scale, known as the Planck scale (10^-33 cm or 10^-43 sec), all the laws of nature are completely unified and are describable in terms of a single unified quantum field. It is at the Planck scale that the quantum nature of gravity, and therefore of space-time, becomes expressed; the usual metrics of space and time become ill-defined and space and time are thus transcended.

The unified field is a completely self-referral field. From within its own infinitely self-referral dynamics the entire creation is expressed. This property of self-referral identifies the unified field with the field of consciousness, since only consciousness has the ability to know itself in a completely self-referral manner. According to Maharishi, the unified field of natural law can be directly experienced by every individual in the state of pure consciousness, when the awareness is in its self-referral state. This is the state of transcendental consciousness, in which consciousness is awake within itself without any impulse of thought or feeling. Transcendental consciousness is experienced during the Transcendental Meditation (TM) technique and enlivened through the TM-Sidhi program, both of which are an integral part of the Maharishi Technology of the Unified Field. As a result of the individual’s awareness identifying itself with the unified field of natural law through the Maharishi Technology of the Unified Field, the individual’s thought and behavior are predicted to become spontaneously in accordance with all the laws of nature. Since the unified field, or consciousness, is the common source of every aspect of nature, including both the individual and his surroundings, all thought and behavior arising from this level are spontaneously appropriate to the needs of both the individual and his environment.

The holistic effects of the Transcendental Meditation and TM-Sidhi program on physiological stability and adaptability, health, efficiency of cognitive functioning, personality development, and behavior, verified by over 300 scientific research studies (Chalmers, Clements, Schenkluhn, and Weinless, in press; Orme-Johnson and Farrow, 1977), are evidence that transcendental consciousness is the unified source of all aspects of individual life and that as a result of the
regular experience of transcendental consciousness, thought and behavior are increasingly effective and beneficial for the individual and his environment. These effects happen as a spontaneous by-product of the practice. Thus, participation in the Maharishi Technology of the Unified Field could serve as an effective means of preventing traffic accidents by culturing the individual to spontaneously act in accordance with the laws of nature.

The importance of the Maharishi Technology of the Unified Field for the prevention of traffic fatalities becomes more dramatically evident when one considers the effects of this technology on the whole society. It has been discovered that when even a small proportion of the individuals of a society participate in the Maharishi Technology of the Unified Field, the whole society begins to gain the benefits of participation in the technology, i.e., behavior is increasingly in accordance with natural law throughout the whole society. This is expressed in such phenomena as decreased rates of crime, suicides, auto and other accidents, and increased economic vitality and improved overall quality of life. The effect of increased coherence in society through the Maharishi Technology of the Unified Field is known as the Maharishi Effect and is documented by a large body of scientific research. This increased coherence solves the problems of communication, which hamper the resolution of social problems, by affecting the society as a whole from the most fundamental level of natural law through the agency of a few individuals practicing the technology.

The mechanism through which this effect occurs is a field effect from the level of the field of pure consciousness, the unified field of natural law. Just as technologies utilizing any of the different fields of nature take advantage of their field character to create effects at a distance (e.g., the electromagnetic field and television reception), the Maharishi Technology of the Unified Field takes advantage of the universal nature of the field of pure consciousness within each individual. By enlivening the unified field through the participation of a few individuals in this technology, every individual in society begins to experience the same benefits of the practice—life in accordance with the laws of nature—through the resulting field effect.

The first study of the Maharishi Effect found that, in cities in the United States with populations larger than 10,000 which had one percent of their population participating in the Transcendental Meditation program by 1972, crime rate decreased in 1973 by an average of eight percent, in comparison to a corresponding eight percent increase in matched control cities. A number of studies have replicated this phenomenon of decreased crime rate on the city level (Dillbeck, in press; Dillbeck, Landrith, and Orme-Johnson, 1981; Hatchard, in press) controlling statistically for possibly confounding demographic variables. In addition, the use of the statistical method of causal analysis in large random samples of cities and metropolitan areas in the United States indicates that participation in the Transcendental Meditation program is the causal factor in decreased crime rate trends in these cities (Dillbeck, Landrith, Polanzi, and Baker, in press). The variables of auto accident rates and suicide rates have also been found to decrease among cities with one percent participation in the Transcendental Meditation program, in contrast to control cities, after controlling for demographic variables (Landrith and Dillbeck, in press).

More recently, it has been discovered that the Maharishi Effect can also be created by as few as the square root of one percent of the population participating in the group practice of the TM-Sidhi program, a more advanced aspect of the Maharishi Technology of the Unified Field. This effect has been verified at the city level using time series intervention analysis. Findings have included reduced homicide rate (Landford, in press a), reduced auto accidents (Orme-Johnson, Alexander, Davies, Chandler, and Larimore, in press a), and increased economic vitality (Landford, in press b). At the state or territorial level, time series analysis has verified decreased crime in the Union Territory of Delhi in India (daily totals) resulting from the group practice of the Maharishi Technology of the Unified Field by the square root of one percent of the population (Dillbeck, Cavanaugh, and Van den Berg, in press).

Similarly, in the state of Rhode Island, a significant improvement in the quality of life was found when a large group of participants in the Maharishi Technology of the Unified Field came to the state, such that the numbers exceeded the predicted threshold for the Maharishi Effect (Dillbeck, Foss, and Zimmermann, in press). In this time series analysis study, quality of life was measured by an index made up of the variables of crime rate, auto accident rate, motor vehicle fatality rate, death rate, rates of consumption of cigarettes and of beer, unemployment rate, and pollution (particulates).
The Maharishi Effect, resulting from the group practice of the Maharishi Technology of the Unified Field by the square root of one percent of the population, has also been repeatedly documented on the national level. Decreased crime and auto accidents with injury, controlling for seasonality, were found in Holland during months when the threshold number of participants in the group practice of the Maharishi Technology of the Unified Field was exceeded (Burgmans, Van der Burgt, Langenkamp, and Verstegen, in press). In the United States, during a two-month period in 1979 when the required number of participants was exceeded, decreased traffic fatalities, accidental deaths, violent crimes, and air traffic fatalities were found, in comparison to the same period of previous years (Davies and Alexander, in press). Other effects found at the national level through the group practice of the Maharishi Technology of the Unified Field include increased economic vitality (stock market) in the United States, Israel, and Britain (Davies and Alexander, in press; Orme-Johnson et al., in press; Orme-Johnson et al., in press a; Beresford and Clements, in press), and decreased violence and turbulence (Alexander, Abou Nader, Cavanaugh, Davies, Dillbeck, Kfoury, and Orme-Johnson, in press; Orme-Johnson et al., in press a; Orme-Johnson and Dillbeck, 1982). A number of these studies have utilized time series analysis (Alexander et al., in press; Orme-Johnson et al., in press a).

Previous research has thus found that the Maharishi Effect reduces traffic fatalities, injuries, or accidents at the city, state, and national level, as well as improving the quality of life on a wide variety of variables. Because the number of participants in the Maharishi Technology of the Unified Field at Maharishi International University (MIU) exceeded the square root of one percent of the population of the United States a number of times during 1982, an excellent opportunity was provided for rigorous time series analysis testing the results of the Maharishi Effect on daily traffic fatalities at the national level. This was the purpose of the present study.

METHOD

SAMPLE—The number of participants in the group practice of the Maharishi Technology of the Unified Field at Maharishi International University in Fairfield, Iowa exceeded the square root of one percent of the population of the United States for an extended period of time during 1982. The square root of one percent of the U.S. population, the predicted number for the Maharishi Effect to be expressed on the national level, was approximately 1,520 at the time; in addition, the required threshold for United States and Canada, approximately 1,600, was also reached many times during that year. An effect of decreased traffic fatalities could be predicted during the periods in which these thresholds were exceeded, according to the theoretical principles of collective consciousness underlying the Maharishi Effect.

One important point to consider is that in addition to the group participants in the Maharishi Technology of the Unified Field at MIU, there are also many thousands of individuals participating in the individual practice of either the beginning or advanced practices of this technology (the Transcendental Meditation technique and the TM-Sidhi program, respectively) around the United States. The practice of the Maharishi Technology of the Unified Field by these individuals will also contribute to the Maharishi Effect in the nation, and for this reason it may be difficult to specify the exact point in the number of group participants at MIU in which the effect would first become expressed. Nevertheless, the use of a criterion such as 1,520 or 1,600 participants to separate high-effect days from low-effect days is particularly useful in that it allows one to specify days on which the effect is not only stronger but is certain to exist according to the principles of the Maharishi Effect. In addition, a comparison of the two criteria for separating high-effect and low-effect days gives some further indication of the effect upon U.S. traffic fatalities of higher numbers in the group practice of the technology. Finally, the analysis of the effects of the group practice of the Maharishi Technology of the Unified Field is also strengthened by assessing the effect of periods in which the number of group participants is not only high but also displayed sudden large increases.

PROCEDURE—Daily traffic fatality totals for the United States for the years 1975 through 1982 were obtained from the U.S. Department of Transportation. Because it is difficult to effectively integrate both high-frequency (e.g., weekly) and low-frequency (e.g., yearly) components of a daily series in a single model, the yearly cycle was removed before explicitly modelling the 1982 data. In order to do so, the daily data from 1975 to 1981 was used to create an average number of fatalities for a given date in the yearly cycle, and this average was subtracted from the same
date in 1982; the modelling and analysis were done on
the deviation scores created in this way. Because there
are 365 days in the year, and 364 is divisible by seven,
the same date falls one day later in the week each year
two days later in leap years). Thus, in averaging over
the seven-year period from 1975 to 1981, the same
date is averaged over almost all days of the week, re­
moving any weekly cycles from the 1975–1981 base­
line. Thus, in subsequently creating the deviation
scores for 1982, the yearly trends are removed from
the series and the weekly trends in the 1982 data are
retained for modelling.

The experimental periods, days when the number
of experts in the Maharishi Technology of the Uni­
ified Field at Maharishi International University
exceeded the criterion for a high Maharishi Effect,
were modelled as homogeneous interventions of the
abrupt permanent type ("zero-order" intervention).
The number of participants in the Maharishi Tech­
nology of the Unified Field was taken as the number of
the afternoon participants; the number in the
morning was generally lower. Thus, an effect at lag
one day is the earliest that could be anticipated. The
fact that the criterion numbers were reached a num­
ber of times during 1982 for various lengths of time
creates an interrupted time series design with multiple
replications, allowing stronger causal inferences to be
made than if the critical number had been reached
only once.

RESULTS

The interrupted time series analysis indicated a sig­
nificant decrease in traffic fatalities in the U.S. after
the number of participants in the group practice of
the Maharishi Technology of the Unified Field ex­
ceeded the criterion for a high Maharishi Effect.
Stronger effects were found when the number of par­
cipants exceeded higher criterion levels or showed
sudden increases well over these criterion levels.

The steps in performing time series analysis are as
follows. An ARIMA (autoregressive or integrated
moving average) noise model is first constructed for
the preintervention time series, based upon the struc­
ture of the autocorrelations and partial autocorrela­
tions of the series (Box and Jenkins, 1976; McCleary
and Hay, 1980). The purpose of this step of the analy­
sis is to best model the behavior of the series based
upon its own history. The criterion for an effective
model is that the autocorrelation structure of the
series is accounted for by the model; that is, the
residuals from the model are a series of independent
and identically distributed random disturbances.
Because of the presence of serial dependence among
the raw series, usual parametric methods, which
assume independent or uncorrelated observations,
are inappropriate for analysis of time series data (Box
and Tiao, 1975). In the case of the present study, the
ARIMA noise model for the raw series was assessed
from the entire series of 1982 deviation scores rather
than a preintervention period, because the inter­
ventions occurred throughout the year.

The second step in the time series analysis is the
joint estimation of the noise model (N₁) and the inter­
vention effect (ω₀I₁) for the full data set (365 obser­
ervations in this case). The term ω₀ is the intervention
parameter and the term I₁, in the case of the zero­
order transfer function used here, is a step function
which is zero everywhere except during the inter­
vention periods. The modelling of the serial corre­
lations of the series by the noise model, which
yields independent residuals, allows the intervention
parameter to be accurately estimated. The noise
model serves as the null hypothesis in the inter­
vention analysis.

In summary, the intervention model tested here,
the zero-order transfer function model, is

\[ Y_t = \omega_0 I_t + N_t, \]

where \( Y_t \) is the observed time series (daily traffic fa­
atalities expressed as deviation scores from the 1975–
1981 daily averages), \( N_t \) is the stochastic noise com­
ponent (ARIMA model), \( I_t \) is the intervention step
function, and \( \omega_0 \) is the intervention parameter to be
estimated. This model, in the present study, was
tested separately at lags one through seven days for
the intervention effect.

In the case of the daily traffic fatality data, the
1982 deviation score series required differencing at a
seven-day lag in order to make the series stationary.
In addition, a moving average component at lag
seven was also included in the model to account for
the weekly cycle of traffic fatalities. The model for \( N_t \)
was thus

\[ (1 - B^7)Y_t = (1 - \phi_7 B^7)a_t + c_t \]

where \( B^n Y_t = Y_{t-n} \), \( \phi_7 \) are moving average pa­
rameters, \( a_t \) is a series of independent and identically dis­
tributed random disturbances, and \( c \) is a constant.
This model successfully transformed the traffic fatali­
ity series into a random disturbance around a constant value, removing any serial dependence from the series; this was indicated by diagnostic tests of residuals of the model. There were no significant autocorrelations or partial autocorrelations from lags 1 to 36, and the Ljung-Box test for the joint significance of residual autocorrelations (Ljung and Box, 1978) was $Q(36) = 24$ for autocorrelations at these lags. This statistic is distributed approximately as chi-square with 35 degrees of freedom, $p > .90$. In addition, a nonparametric test of runs of autocorrelations of the residuals above and below zero was nonsignificant, as well as a test of runs of the residuals above and below the mean. The residuals were also normally distributed, as indicated by measures of skewness, kurtosis, and studentized range. The null square with 35 degrees of freedom, of the residuals above and below zero was nonsignificant, indicating the appropriate-ness of the model for describing the series independent of the intervention parameter.

The first impact parameter assessed was the effect of the group practice of the Maharishi Technology of the Unified Field on those days when the number of participants exceeded a criterion of 1,520 (on the average resulting from a rise of 60 to 80 participants). During 1982, this criterion was reached 17 times, for periods ranging from 1 to 37 days consecutively, and for a total of 125 days. The zero-order intervention was tested at lags one through seven days. As indicated by table 1, which lists parameter values and significance tests for the intervention analyses, the intervention parameter was marginally significant at lag two days and significant at lags three through six, reaching a peak at lag four days.

The intervention parameter at lag four days was $-0.977$. The average number of traffic fatalities per day (in deviations from the average of the prior seven years for that day, adjusted for the noise model) was $-1.24$ for days over the threshold of 1,520 participants; the mean number of traffic fatalities per day during the other days of 1982 was $-0.26$.

The second impact parameter assessed was the effect of the group practice of the Maharishi Technology of the Unified Field on those days when the number of participants exceeded a criterion of 1,600 (an average resulting from a rise of 60 to 80 participants). This criterion was exceeded ten times during 1982, for periods from 1 to 14 consecutive days, and for a total of 41 days. The zero-order intervention was tested at lags one through seven days; each of lags two through seven reached statistical significance, with the peak effect at lag five days. Table 2 lists the intervention analysis parameters and tests of significance.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>INTERVENTION ANALYSIS PARAMETERS AND SIGNIFICANCE TESTS FOR 1,520 PARTICIPANTS IN THE MAHARISHI TECHNOLOGY OF THE UNIFIED FIELD</th>
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<tbody>
<tr>
<td>LAG</td>
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<td>One Day</td>
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<td></td>
<td>$\omega_0^{**}$</td>
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<td>Two Days</td>
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<td>Seven Days</td>
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* Seven day moving average parameter.

** Intervention parameter for 1,520 participants at Maharishi International University.

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<tr>
<th>TABLE 2</th>
<th>INTERVENTION ANALYSIS PARAMETERS AND SIGNIFICANCE TESTS FOR 1,600 PARTICIPANTS IN THE MAHARISHI TECHNOLOGY OF THE UNIFIED FIELD</th>
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* Seven day moving average parameter.

** Intervention parameter for 1,600 participants at Maharishi International University.
The intervention parameter at lag five days was $-2.50$. The average number of traffic fatalities per day (again in deviations from the average of that day for the prior seven years and adjusted for the noise model) was $-2.82$ during the days over 1,600 participants; the average during the other days was $-0.32$.

A final analysis was performed to indicate whether a rapid and substantial increase in the number of participants in the Maharishi Technology of the Unified Field would result in a larger effect on national traffic fatalities. To do so, two additional interventions were defined, as days on which there were increases of participants in the technology of at least 1,520 or the 1,600 criteria. The effects of these two variables were tested at lags one through seven days and both were significant at lag one. These increases in safety, due to safer roads, safer cars, better emergency care, etc., was enough to affect an increase in 1982 VMT which was not as great as in previous years due to a sluggish national economy during that period. The proportion of the 1981–1982 decrease due to these factors was estimated as between 56% and 69% (between 8% and 10% of the 14.4% decrease). An additional seven percent of the decrease is accounted for by longer-term demographic shifts; the proportion of the young driver (high-risk) population in the U.S. has been declining.

Although these authors studied changes from 1980 to 1982 rather than from 1981 to 1982, if one assumes that the proportions are constant over the two periods then between 63% and 76% of the 1982 decrease is predictable from long-term trends. Thus, of the decrease from 49,301 fatalities in 1981 to 43,721 in 1982 (from Hedlund et al., 1983), between 1,339 and 2,065 (from 3.7 to 5.7 per day) can only be attributable to new influences in 1982. Two major factors, decreased driving under the influence of alcohol and increased use of safety restraints, were proposed on the basis of less rigorous evidence to account for the majority of the remaining decrease in fatalities (Hedlund et al., 1983).

The three major questions to be addressed concerning the relation of the above findings to those of the present study are:

1. How adequate are the conclusions of the above study concerning the proportion of changes attributable to long-term trend.
2. What proportion of the 1982 decrease not attributable to long-term trends could be accounted for by participation in the Maharishi Technology of the Unified Field.
3. How the effect of this participation relates to the other possible factors influencing the short-term portion of the 1982 decrease.
With regard to the first question, we prefer the conservative estimate of the effect of long-term trends on the 1982 traffic fatality decrease, and suggest that even in this case the proposed model of these long-term trends may be quite preliminary, at least as it affects the 1982 decrease. Assuming that the demographic portion of the long-term trends are accurate, the proportion of the trends due to long-term safety improvements, economic factors, and VMT is open to further question. Firstly, the trend of increased safety (lower rate of fatalities per VMT) over the past 40 years does not hold from 1975 to 1980, where the rate is approximately constant. Thus, this aspect of the model does not seem to apply. However, Hedlund et al. (1983) note that VMT increased in 1982; it did so at a slower rate than in previous years due to economic factors, and this was translated by their model into a predicted decrease in fatalities. To be more precise, their model makes use of monthly variations in VMT, rather than aggregate yearly totals, to predict fatalities. Secondly, this model predicts increasing fatalities in 1983 as the U.S. economy emerges from recession in the second half of the year. In contrast, the actual traffic fatalities decreased further by approximately 6.3% (adjusted for VMT) in 1983. This indicates that whatever new influences began to be felt in 1981 and 1982, leading to decreased fatalities, may not be so clearly linked to economic and VMT changes. This point will be addressed further below. For this reason we prefer the lower estimate of long-term influences on the 1982 decrease (leaving 5.7 fatalities per day unexplained by these trends), and suggest that an even smaller estimate of long-term effects may be appropriate.

With regard to the relationship of the Maharishi Technology of the Unified Field to the remaining 5.7 or more fatalities per day, it is not possible to exactly specify what proportion of the 1982 short-term decrease in traffic fatalities is attributable to the technology based upon the results of the present study; nevertheless, based upon the findings reported here, it is clear that the magnitude of the 1982 decrease attributable to new influences (5.7 fewer fatalities per day) is consistent with the size of effects found in this study. That is, the intervention parameters of -1.0 and -2.5 fatalities per day for days over a criterion of 1,520 and 1,600, respectively, indicate: 1) that larger numbers of participants are associated with larger decreases in fatalities (even allowing for error in parameter estimation); and 2) that this range of decrease could be expected from relatively small fluctuations in the daily number of group participants in the technology (e.g., 60–80) when overall numbers are near this level. It was also found that the decrease in fatalities could be at least five times as great when there were sudden large increases in the number of participants (over 100) and numbers were also over the criterion levels.

These loose empirical constraints on the parameter size associated with various levels of group participation in the Maharishi Technology of the Unified Field are consistent with the overall short-term decrease of 5.7 fewer daily fatalities because the average daily attendance in the group practice of the technology increased by more than 550 persons from 1981 to 1982. Since the influence of coherence generated by the group practice is predicted to rise proportionally with the square of the group size, the influence of a given increase in the number of participants should be greater when the level of participation is higher. Even when this factor is considered, the very large increase from 1981 to 1982 in group participation, from an average of 900 to an average of 1,450, would easily account for an average short-term decrease of 5.7 fatalities per day throughout the year, if not a larger amount.

Although an exact parameter estimate for an overall yearly decrease was not able to be directly calculated with the design of the present study, the study nevertheless establishes a causal connection between group practice of the Maharishi Technology of the Unified Field and decreased traffic fatalities in a way that is difficult to do with monthly or yearly data. It is highly unlikely that other possible causes of decreased traffic fatalities would coincidentally covary with daily fluctuations in the number of participants in the technology. The point of the above qualitative analysis is that the magnitude of the intervention parameters obtained from the major daily analyses are consistent with the size of the overall 1982 short-term decrease in fatalities.

The second major point of consideration is the relationship between the influence of the Maharishi Technology of the Unified Field and other possible explanatory factors related to the short-term portion of the 1982 traffic fatality decrease. In their analysis of the 1982 traffic fatality decrease, Hedlund et al. (1983) note that using several indirect methods, perhaps 21% of the short-term 1982 decrease can be attributed to decreased driving while under the influence of alcohol. They also suggest that perhaps seven
percent of this same total may be attributed to increased use of safety restraints while driving. In a purely descriptive analysis, they also identify that: 1) a proportionally larger decrease in fatalities occurred among the highest-risk age group of drivers, 15–19 years, even after adjusting for demographic changes (primarily among the males of this age group); and 2) there were consistent geographic differences, with north-central states showing the highest reduction, followed by adjacent states, the east and west coastal areas, and then the gulf and southwest states.

It is clear from this discussion that both participation in the Maharishi Technology of the Unified Field and the two quantitative factors of less alcohol abuse and greater safety restraint use could perhaps have accounted for the same total short-term 1982 decrease in traffic fatalities. However, it must be understood that participation in the Maharishi Technology of the Unified Field is not independent or exclusive of other mechanisms for decreased traffic fatalities. That is, the Maharishi Effect is specifically predicted to result in measurable changes in behavior to be more in tune with natural law, and this would be reflected in such things as reduced alcohol consumption (Orme-Johnson and Gelderloos, in press) and greater vigilance, alertness, and more responsible behavior. Thus, the findings of decreased alcohol involvement in fatalities, increased vigilance (safety restraints), and increased calmness and alertness among the young and male drivers who are more prone to recklessness, are all findings consistent with the type of changes expected from the Maharishi Effect. In addition, the geographical analysis reveals that the decrease in traffic fatalities is greater in areas which are roughly closer to the location of the group practice of the Maharishi Technology of the Unified Field (Iowa, in the north-central states).

One final point in considering the causes of the 1982 decrease in traffic fatalities, which was already noted briefly, is that the strong resurgence of the U.S. economy in 1983 and 1984, without taking into account the Maharishi Effect, would be expected to lead to a larger increase in vehicle miles traveled than in 1982 and thus a reversal of the strong downward trend in fatalities found in 1982. This provides an ideal opportunity to assess the effects of the Maharishi Technology of the Unified Field because, assuming that a large group of participants is maintained, the Maharishi Effect would predict a continued decline, or at least no increase, in traffic fatalities even under these conditions. It was already noted that 1983 dropped 6.3% (adjusted for VMT), and future trends will continue to test this prediction. At the same time, the presence of the Extended Maharishi Effect also gives rise to a holistic improvement in national life which includes economic trends as well (Beresford and Clements, in press; Orme-Johnson and Gelderloos, in press).

In conclusion, the importance of the influence of the Maharishi Technology of the Unified Field in prevention of social disorder is most fully appreciated in the context of its holistic effects. The collective effects of this technology include not only reduced traffic fatalities and accidents but, as reviewed earlier, reduced crime rate, reduced suicide rate, improved economic vitality, and improvements in comprehensive quality of life indices.

This holistic influence is evidence that the Maharishi Effect acts on a level basic to all expressions of behavior; that is, it is a field effect on the level of pure consciousness, identified as the unified field of natural law. The increased coherence in collective consciousness resulting from this effect gives rise to behavior which is more fully in accordance with natural law, and thereby supportive not only to individual needs but to the whole social environment.

The comprehensiveness of effects and the very small number of participants in the Maharishi Technology of the Unified Field required for these effects make the technology extremely practical for implementation at the national or even international level. A recent and historic assembly of 7,000 experts in the Maharishi Technology of the Unified Field, the square root of one percent of the world's population, during December 1983 and January 1984, resulted in comparable effects on a worldwide scale (Orme-Johnson, Cavanaugh, Alexander, Gelderloos, Dillbeck, Lanford, and Abou Nader, in press b). Decreased traffic fatalities, air traffic fatalities, crime, and infectious diseases, increased positivity of events in international conflict areas, and increased stock market indices were found in countries around the world during the period of the assembly, with a reversal of these trends in the period after the assembly; in addition, these effects were not found in prior years at the same time of year.

These results and those of the present study indicate that any nation can easily improve the quality of life of the nation or world by creating a suffi-
sufficiently large group of participants in the Maharishi Technology of the Unified Field. Implementing the technology in educational institutions is an ideal way to create such groups; the potential for large groups is already available in such institutions and the technology has repeatedly been found to improve educational outcomes in the individual students. With even one university of 7,000 students adopting the Maharishi Technology of the Unified Field, any nation can lay a foundation for continued improvement in the quality of national and international life.

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REFERENCES


DILLBECK, M. C. In press. The Transcendental Meditation program and a compound probability model as predictors of crime rate change. In Collected papers, vol. 4.


LANDRITH III, G. S., and DILLBECK, M. C. In press. The growth of coherence in society through the Maharishi Effect: Reduced rates of suicides and auto accidents. In Collected papers, vol. 4.


