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MICHAEL C. DILLBECK,1 VICKI MITTLEFEHLDT,2 ALCINE POTS LUKENBACH,2 DINAH CHILDERESS,2 ANN ROYER,2 LYNN WESTSMITH,2 and DAVID W. ORME-JOHNSON1

1 Maharishi International University, Fairfield, Iowa, U.S.A.
2 Maharishi International Caribbean, Inc., Fajardo, Puerto Rico

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Crime in Puerto Rico decreased when the number of individuals collectively practising the Transcendental Meditation and TM-Sidhi programme exceeded the square root of one percent of the island’s population.—EDITORS

The present study uses time series analysis to test the effect of the group practice of the Transcendental Meditation and TM-Sidhi program, an integral part of the Maharishi Technology of the Unified Field, on crime rate in Puerto Rico. Previous research indicates that as few as one percent of the population of a city participating in the Transcendental Meditation program, or the square root of one percent of a state or nation participating in the group practice of the Transcendental Meditation and TM-Sidhi program, is sufficient for increased coherence in the collective consciousness of the whole society to be displayed.

The opportunity for this study arose when an academy was opened in Puerto Rico and was used for long-term courses involving the group practice of the Transcendental Meditation and TM-Sidhi program, as well as for occasional short-term courses. The number of participants in these programs rose steadily until it exceeded the square root of one percent of the population of Puerto Rico for two weeks in April of 1984. Time series analysis indicated a decrease in crime in this month, coupled with an increase when the long-term group left Puerto Rico (joint significance, p<.025). This effect was not attributable to any change in police practices in Puerto Rico. The results of this study give further evidence that the Transcendental Meditation and TM-Sidhi program is able to be practically applied in any location to improve the quality of life in society.

INTRODUCTION

During the past 13 years, a large body of scientific research has outlined the positive effects of the Transcendental Meditation and TM-Sidhi program on physiological, psychological, and social functioning (Chalmers, Clements, Schenkluhn, and Weinless, in press; Orme-Johnson and Farrow, 1977). This program is practiced by more than two and one-half million people around the world.

The Transcendental Meditation and TM-Sidhi program, an integral component of the Maharishi Technology of the Unified Field, is a subjective technology for the full development of human life through raising individual and collective consciousness to alliance with the total potential of natural law. The total potential of natural law, the unified field of all the laws of nature, has been discovered by quantum physics in its most recent formulation of extended supergravity theory (e.g., Ellis, 1983; Freedman and Van Nieuwenhuizen, 1978). Maharishi Mahesh Yogi, founder of the Transcendental Meditation and TM-Sidhi program, has identified the unified field of all the laws of nature as the field of pure consciousness,
experienced as the simplest form of human awareness during the Transcendental Meditation and TM-Sidhi program (Clements, Chalmers, Bauhofer, and Werner, 1982).

The Transcendental Meditation technique is a simple mental procedure, easily learned by anyone, which allows the individual to spontaneously experience subtler levels of a thought until the mind reaches the state of least excitation of consciousness, the field of pure consciousness, the experience of the unified field of all the laws of nature. The opening of awareness to the unified field of natural law, as attention is brought to increasingly refined levels of mental activity during Transcendental Meditation, is directly parallel to the sequential unification of natural law which occurs as physical measurement is brought to finer scales of time and distance. The TM-Sidhi program consists of advanced practices designed to enliven the field of pure consciousness in individual awareness; by culturing the ability to project thought and action from the field of pure consciousness, the unified field of natural law, increased mind-body integration and effectiveness of thought and action are predicted to occur. The holistic benefits of the Transcendental Meditation and TM-Sidhi program on all levels of individual life (Chalmers et al., in press; Orme-Johnson and Farrow, 1977) supports the description of the field of pure consciousness as the unified source of all expressions of consciousness in the physiological functioning, thought, and behavior of the individual.

The Transcendental Meditation and TM-Sidhi program has also been found to produce an effect of coherence in the collective consciousness of society. As early as 1960, Maharishi predicted that as few as one percent of the population of a city participating in the Transcendental Meditation technique would be sufficient for the entire population to display measurable improvement in the quality of life, as illustrated by a decrease in such indicators of social turbulence as crime rate. This phenomenon has been named the Maharishi Effect (Borland and Landrith, 1977). With the introduction of the TM-Sidhi program, which produces an even more powerful influence of coherence in individual and collective consciousness, it has been predicted that as few as the square root of one percent of the population of a society participating in the group practice of the Transcendental Meditation and TM-Sidhi program, termed the group dynamics of consciousness, is sufficient for what has become known as the Extended Maharishi Effect to be displayed throughout society (Clements et al., 1982).

The theoretical explanation of the Maharishi Effect is based on the description of pure consciousness as the fundamental field of nature, experienced during Transcendental Meditation and enlivened through the TM-Sidhi program. Because pure consciousness is a field, the positive influence that occurs through enlivening this field is experienced not only by those directly participating in the Transcendental Meditation and TM-Sidhi program, but is also shared by all others in the environment. As the unified field of natural law, the field of pure consciousness, is enlivened in the collective consciousness of society through the Maharishi Effect, the behavior of all the individuals in society spontaneously begins to be increasingly in accordance with natural law. With decreased violation of natural law by the individuals in society, turbulence, incoherence, and suffering are diminished.

A substantial and growing body of scientific research has supported the reality of the Maharishi Effect. The initial study of this phenomenon found that those cities in the United States larger than 25,000 population which reached the one-percent level of participation in the Transcendental Meditation program in 1972 displayed a decreased crime rate in 1973, in contrast to matched control cities (Borland and Landrith, 1977). In a larger study, which included all U.S. cities larger than 10,000 population with one-percent participation in the Transcendental Meditation program in 1972, crime rate was again found to decrease in 1973 in comparison to matched control cities; in addition, there was a decreased trend of crime rate over the next five years in these cities (Dillbeck, Landrith, and Orme-Johnson, 1981). A separate study on the same larger sample of "one-percent" cities and control cities indicated that rates of suicides and auto accidents also decreased over the five years after the cities reached the one-percent level of participation in the Transcendental Meditation program (Landrith and Dillbeck, in press). Other studies have found decreased crime rate among cities of the Kansas City and Cleveland metropolitan areas which reached a sufficient number of participants in the Transcendental Meditation program for the Maharishi Effect to be found (Dillbeck, in press; Hatchard, in press).

Many of the previous studies have controlled for other demographic variables which might represent
plausible alternative causes for the decreased crime rate found in the studies. In addition, two studies utilized the method of cross-lag panel analysis with random samples of 160 U.S. cities and 80 U.S. metropolitan areas (Dillbeck, Landrith, Polanzi, and Baker, in press); if the somewhat restrictive assumptions of this methodology are met, one is able to reject the hypothesis that any other variable is the cause of the observed correlational relationship, and evidence is provided as to which of the two variables is the cause of the other. The two studies cited above using this method indicated that participation in the Transcendental Meditation program is the cause of the decreased crime rate associated with its practice.

An even more powerful methodology for assessing the Maharishi Effect is the use of direct experimental intervention studies. Because only the square root of one percent of a population practicing the TM-Sidhi program together is predicted as necessary for the Extended Maharishi Effect to be expressed, it is possible to move this small number of individuals into an area and evaluate their effect. Several studies have used the methodology of time series analysis to evaluate the effects of such interventions on measures of social disorder; the use of time series analysis allows one to assess the effects of an intervention independent of any prior trends in the behavior of the society (McCleary and Hay, 1980).

One of these time series studies measured the influence of Maharishi’s Ideal Society Campaign in the state of Rhode Island in the summer of 1978 (Dillbeck, Foss, and Zimmermann, in press). In this campaign, 300 Governors of the Age of Enlightenment, teachers of the Transcendental Meditation program who also practice the TM-Sidhi program, went to the state of Rhode Island at Maharishi’s request to improve the quality of life through their collective practice and through teaching Transcendental Meditation around the state. There were sufficient numbers of participants in the Transcendental Meditation and TM-Sidhi program in the state during this campaign for an improvement in the quality of life to be predicted. An Ideal Society Index composed of eight quality of life variables reflected improved coherence in society during the campaign in Rhode Island, in contrast to a control state, using time series analysis. A less pronounced but still significant improvement in the quality of life was also found after the campaign, in contrast to the control state.

A similar study used time series methodology to measure the influence of a Vedic Science course held in New Delhi, India (Dillbeck, Cavanaugh, and Van den Berg, in press). There were sufficient numbers of individuals participating in the group practice of the Transcendental Meditation and TM-Sidhi program during this course to predict a decrease in crime in the entire Union Territory of Delhi during the five-month period of the course. A highly significant decrease was found in an analysis of daily crime totals.

Another intervention study assessed the effects of Maharishi’s World Peace Project in late 1978, in which groups of Governors of the Age of Enlightenment were sent to five trouble-spot areas of the world in Central America, Southeast Asia, the Middle East, and southern Africa (Orme-Johnson, Dillbeck, and Bousquet, in press). An analysis of data on events relating to conflict and peace (obtained from a large independent source of international data) demonstrated a significant improvement in domestic affairs and international relations for the trouble-spot countries during the period of the project. Furthermore, analyses of similar data for the world as a whole showed that international relations also improved on a worldwide basis.

A subsequent study found that, on three occasions when large groups of participants in the Transcendental Meditation and TM-Sidhi program gathered together for advanced courses in or near Holland exceeded the number required for the Extended Maharishi Effect to be predicted for Holland, significantly decreased crime rate was found in the country of Holland as a whole (Burgmans, Van der Burgt, Langenkamp, and Verstegen, in press). A number of other studies have also demonstrated, using time series analysis, significant improvements in the quality of life at the national level through the group practice of the Transcendental Meditation and TM-Sidhi program. These improvements include increased economic vitality in the United States (Orme-Johnson, Cavanaugh, and Krieger, in preparation) and in Britain (Beresford and Clements, in press), improved quality of life along a wide range of parameters in Israel (Orme-Johnson, Alexander, Davies, Chandler, and Larimore, in press), and reduced violence in Lebanon (Alexander, Abou Nader, Cavanaugh, Davies, Dillbeck, Kfoury, and Orme-Johnson, in press).

The present study was conducted in Puerto Rico to assess the influence of courses in which the square root of one percent of the population of Puerto
Rico participated in the group practice of the Transcendental Meditation and TM-Sidhi program. Time series intervention analysis is used to most accurately measure the impact of this group on crime rate in Puerto Rico as a whole.

METHOD

SAMPLE—Large courses involving the group practice of the Transcendental Meditation and TM-Sidhi program began on a permanent basis in late December 1981 in Fajardo, Puerto Rico, a small town approximately 68 miles from metropolitan San Juan. Courses were held during each subsequent month over the next ten months, with varying numbers. In November 1982, a permanent group of course participants arrived; this group brought the total number of Transcendental Meditation and TM-Sidhi program participants, including staff and those on shorter courses, to numbers consistently over 100 persons.

According to the "square root of one percent" formula, the number of participants in the group practice of the Transcendental Meditation and TM-Sidhi program required to create the Extended Maharishi Effect for the slightly less than 3.4 million people of Puerto Rico is approximately 185. Because only monthly data were available, this study adopted a criterion of reaching the required number for at least two weeks of the month. This criterion was reached for the only time in April of 1984, when in addition to the more permanent group there was a large special course in the last two weeks of April. In May and June of 1984 the size of the group fluctuated between 60% and 80% of the required number. Then, at the end of June 1984, the long-term group left Puerto Rico for another location, offering the additional opportunity to test the influence of the departure of the group practicing the Maharishi Technology of the Unified Field in Puerto Rico.

PROCEDURE—Monthly crime totals for Puerto Rico as a whole were provided by the Puerto Rico Police Department for the period from January 1969 to March 1984 (183 observations). The crime figures were the total "Type 1" crimes; this index is the same as the Uniform Crime Index total of the Federal Bureau of Investigation of the U.S., consisting of the following categories of crimes: homicide, forcible rape, robbery, aggravated assault, burglary, larceny, and motor vehicle theft. Monthly totals were not adjusted for population changes. The reason for this is that because only ten-year census figures were available, the adjustment would involve simply a linear interpolation to gain monthly estimates; this in turn would result in a simple linear transformation of the raw data, which could just as easily be modeled by time series procedures.

The baseline (preintervention) period used to diagnose the noise model for the time series was from January 1969 to March 1984 (183 observations). The two major events whose effects were to be tested were the attainment of the required number of participants in the Maharishi Technology of the Unified Field in April 1984, and their departure at the end of June 1984. Because each of these events involved the same mechanism, and because each comprised only a single monthly data point in a time series of 189 points, these two events were combined into a single intervention parameter. This increased the statistical power of the intervention analysis and tested the joint probability of the two events.

There was some fluctuation in the numbers before April 1984; however, because the Extended Maharishi Effect is predicted to require a threshold number (the square root of one percent) these fluctuations can in principle be ignored. At the same time, although the group was not at the required level at the time the long-term group left at the end of June, the departure was still considered to be a major event because: 1) the numbers had been maintained between 60% and 80% of the required amount since the end of April and thus some continuing effect of the large group might be expected, and 2) the departure at the end of June constituted virtually the entirety of the group of experts who had been participating in the group practice of the technology in Puerto Rico, and thus the influence of the Extended Maharishi Effect from there could be expected to suddenly stop.

A zero-order transfer function was constructed in two separate ways in order to test the joint probability associated with the two major events (April and July of 1984). The first way was to define the zero-order transfer function as a step function which was zero everywhere except in April, where it had a value of one, and July, where it took a value of negative one. An alternative intervention transfer function was also tested, which was the same as the prior function except that it had a value of negative six-tenths in July; this was done because the number of individuals who left with the permanent group at the end of
June was approximately 60% of the number of group participants required to initiate the Extended Maharishi Effect for all of Puerto Rico. Two separate analyses were run to test these two separate intervention transfer functions.

RESULTS

The predicted time series model for the raw data is 

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

where \( Y_t \) is the observed time series, \( I_t \) is a step function representing the intervention which is as defined above, \( \omega_0 \) is a parameter indicating the size of the intervention effect, and \( N_t \) is a stochastic noise term which is identified by time series procedures using autoregressive or integrated moving average (ARIMA) models (Box and Jenkins, 1976).

The ARIMA model for \( N \) is determined by examining the autocorrelation and partial autocorrelation structure of the observed preintervention series. By modeling and removing the time dependent structure of the series, the intervention parameter is able to be accurately identified (Box and Tiao, 1975; Tiao, Box, and Hamming, 1975). In modeling the present series, the data had to be differenced at a one-month lag in order for the series to be stationary around its mean. In addition, the model for \( N \) required autoregressive parameters of the first order, twelfth order (yearly seasonality), and twenty-fourth order (biannual seasonality). This model was able to transform the raw series into a series of random disturbances around a constant value, removing the autocorrelation structure from the data.

The full data set (189 observations) was next employed to jointly estimate the intervention component (\( \omega_0 \)) and the autoregressive parameters of the noise model (\( N \)). Estimation was separately made for each of the two intervention functions previously described. In both cases, the fit of the model was appropriate, as indicated by the significance of the noise model parameters and as indicated by the diagnostic tests on the residuals. Analysis of the residuals indicated that, in both tests, none of the autocorrelations or partial autocorrelations (lags 1–36) was significant at the .05 level. A similar conclusion was indicated by the Ljung-Box test for the joint significance of residual autocorrelations (Ljung and Box, 1978). This test gave, for lags 1–12, 1–24, and 1–36, values which were nonsignificant. For the two intervention functions (−1 and −.6 in July, respectively) the Ljung-Box statistics for the joint significance of observed autocorrelations were \( Q = 9 \) and \( Q = 9 \) for lags 1–12, \( Q = 18 \) and \( Q = 17 \) for lags 1–24, and \( Q = 25 \) and \( Q = 25 \) for lags 1–36; these \( Q \) values were distributed as chi-square with 8, 20, and 32 degrees of freedom for the three sets of lags, respectively. None of these values approached statistical significance; this is consistent with the hypothesis of random noise disturbance.

Table 1 lists the parameter estimates for both analyses and their corresponding significance tests. The intervention parameter for the first analysis (using −1 for July in the transfer function) was −543.1, \( Q = 9 \) and \( Q = 9 \) for lags 1–12, \( Q = 18 \) and \( Q = 17 \) for lags 1–24, and \( Q = 25 \) and \( Q = 25 \) for lags 1–36; these \( Q \) values were distributed as chi-square with 8, 20, and 32 degrees of freedom for the three sets of lags, respectively. None of these values approached statistical significance; this is consistent with the hypothesis of random noise disturbance.

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where \( Y_t \) is the observed time series, \( I_t \) is a step function representing the intervention which is as defined above, \( \omega_0 \) is a parameter indicating the size of the intervention effect, and \( N_t \) is a stochastic noise term which is identified by time series procedures using autoregressive or integrated moving average (ARIMA) models (Box and Jenkins, 1976).

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Table 1 lists the parameter estimates for both analyses and their corresponding significance tests. The intervention parameter for the first analysis (using −1 for July in the transfer function) was −543.1, \( t(160) = −2.02, p<.025 \); for the second analysis (using −.6 in July) the intervention parameter was −647.3, \( t(160) = −1.98, p<.025 \). These results indicate that there was a significant reduction in crime in Puerto Rico in April 1984, with the establishment of the required group participating in the group practice of the Maharishi Technology of the Unified Field, and a corresponding increase in crime in July 1984, with the departure of the group (fig. 1). The intervention parameters of −543.1 and −647.3 give, for the two respective analyses, the average of the monthly decrease in crimes in Puerto Rico associated with attaining the required number of group participants in the Maharishi Technology of the Unified Field, and the corresponding monthly increase in crimes associated with the departure of the group.

DISCUSSION

A significant decrease in crime in Puerto Rico was found with the establishment of a group of the pre-

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* \( p<.025 \), one-tailed ** \( p<.01 \), two-tailed
FIG. 1. DECREASED CRIME TOTALS WERE FOUND IN PUERTO RICO THROUGH THE EXTENDED MAHARISHI EFFECT. This figure illustrates the decreased monthly crimes associated with the Maharishi Effect in contrast to the average monthly change for all other months from January 1969 to September 1984, after adjusting for the time series noise model. The Maharishi Effect period is calculated from the intervention model one zero-order transfer function.

dicted size participating together in the Maharishi Technology of the Unified Field, and a corresponding increase in crime was found with the departure of the group. This effect was found with time series analysis, which insures that these changes in crime rate were independent of any cyclical or time-dependent structure of the crime rate prior to the effect of the group practice of the Maharishi Technology of the Unified Field.

Although both intervention transfer functions were of comparable statistical significance, the model with a - .6 in July had a substantially larger intervention parameter value, - 647.3 compared to - 543.1. This is because the model with 1 and - 1 in April and July takes the average of the two monthly change values (after adjusting for the autoregressive parameters and changing the sign of the July values); in contrast, the other model further adjusts the two scores by assuming that the observed July increase is only 60% of the value it would have been had a group of the size required to initially create the Maharishi Effect (see Introduction) left at the end of June. Because the statistical significance of the two intervention models is almost exactly equal, it may be useful to consider these two intervention values as forming a range for the possible size of the effect. It is also important to note that the statistical significance of the intervention is robust with respect to these alternative specifications of the exact model.

An additional perspective on the results is obtained by taking the Puerto Rico crime series from January 1969 to March 1984 (before reaching the required number) and using time series methods to forecast expected crime totals for April through September of 1984. These expected or forecast values are based upon the normal cyclical trends in the series as specified by the ARIMA noise model. When this is done, the actual values of all six months are below expected values. For April through June, the actual crime totals are below the forecast totals by 550, 628, and 770 crimes, respectively. This indicates that after the immediate decrease in April, the effect was maintained, or even increased slightly, through June. For July through September, the actual crime totals were below the forecast totals by 237, 168, and 119 crimes, respectively. Thus, although in July there was a substantial reversal of the previous decrease, the July total was still below the expected value (by about 43% of the original April decrease), and then the actual total continued to approach the expected value more closely in August and September.

One possible reason that the totals were still substantially below the expected value in July was that in July there was a large assembly for the group practice of the Maharishi Technology of the Unified Field at Maharishi International University (MIU) in the United States (Iowa). The group from Puerto Rico had in fact left to go to this assembly. The MIU assembly was larger than the number required to create a positive influence in English-speaking North America (1,600), yet smaller than the number required for the world's population (7,000). There were more than 4,000 participants for the first 13 days of July, and then slightly in excess of the number required for the U.S. and Canada for the rest of the month. Thus, the data is not inconsistent with the possibility that there was also an effect of this assembly in decreasing crime totals in Puerto Rico. However, it is not possible to test this precisely, because the event of the large group leaving Puerto Rico at the same time confounds the situation, particularly as the mechanics of how to specify the relative magnitude of these two events is not yet known. In addition, the details of the manner in which the influence of coherence spreads from one continent to others is not yet fully specified when the size of the assembly is sufficient for one continent but not for
the whole world; it could be predicted that some influence would be felt in territories that are not too far distant, yet how to weigh the relative importance of distance and population needs to be more fully understood. Finally, a clear test of the effect of the July assembly at MIU would also require daily or weekly data, which are not available, to look at effects in different parts of the month.

Another topic to be addressed is the possibility of alternative causes of the findings reported in this study. One class of alternative hypotheses which must be considered is the possibility of some other intervention in Puerto Rico being responsible for the variations in crime at this time. A primary source of such an effect is a police department program. There was no such new program at the times assessed in this study (April or July 1984), although there was the continuation of an existing police program. That is, the Puerto Rico Police Department attributed an apparent decreased trend of crime in late 1982 to air-ground police vigilance using helicopters, patrol cars, and motorcycles (The San Juan Star, 1982, 1983). The drop in crime at this time was temporary, after which time crime continued to rise. Two newspaper articles differed on the date at which such vigilance procedures were inaugurated. Direct contact with the police department indicated that in May of 1980 the procedures were begun with 2 helicopters, 15 motorcycles, and 12 cars; in January 1983, the department had 2 helicopters, 10 motorcycles, and 27 cars (The San Juan Star, 1983). Thus, although the department had increased the number of police cars by 15 and decreased the number of motorcycles by 5, the program was essentially the same except for allowing direct communication between helicopters and cars (The San Juan Star, 1983).

In order to assess whether the establishment of the vigilance system in May 1980 had a significant effect on crime reduction, an intervention analysis was also run for the intervention of the vigilance system at this date. The same noise model was used as for the major analyses above. The police intervention was defined as zero everywhere except in May 1980 and thereafter; the t-statistic for the intervention was 0.62. Residuals were comparable to the previous major analysis, indicating that the model was specified correctly. Thus, the establishment of the police air-ground vigilance plan in May 1980 was not associated with a significant decrease in crime during the period of this study, but was rather associated with a nonsignificant increase. This relationship is common because police vigilance programs are often a response to rising trends of crime.

In light of the previous extensive research on the effects of a sufficient number of individuals participating in the Transcendental Meditation program in cities or participating in the group practice of the Transcendental Meditation and TM-Sidhi program, and with the absence of a viable alternative explanation of the effects, it is concluded that the group practice of the Maharishi Technology of the Unified Field by the required number in April 1984 is responsible for the sudden decrease in crime at this time. In addition, the departure of the group was associated with an increase in crime, helping to establish causality in both directions.

The results of the present study are thus consistent with the prediction that participation in the Maharishi Technology of the Unified Field by a group of sufficient size creates an influence of coherence in the collective consciousness of the entire area, resulting in decreased turbulence in society. Recent research also indicates that the decreased negative trends and increased positive trends found in society through the Extended Maharishi Effect are even expressed on a global scale as a result of the collective practice of the Maharishi Technology of the Unified Field by a single group of 7,000 experts, the square root of one percent of the world’s population (Orme-Johnson, Cavanaugh, Alexander, Gelderloos, Dillbeck, Lombard, and Abou Nader, in press).

The fact that only a small group participating in the group practice of the Maharishi Technology of the Unified Field is sufficient to create coherence in an entire state or nation provides the leaders of every government, for the first time, with a proven technology to improve the quality of life in society in a practical and easily-implemented way. It is suggested that this practice of the Maharishi Technology of the Unified Field be adopted in the educational systems of society; many educational institutions are of sufficient size to provide the group of 7,000 experts in the Maharishi Technology of the Unified Field required for the whole world’s population. As documented by the large body of scientific research described earlier (Chalmers et al., in press; Orme-Johnson and Farrow, 1977), the widespread use of this technology will create not only a beneficial effect for the students of the nation but will at the same time create a foundation for coherence and harmony in the whole society, or, with a group of sufficient size, in the whole world.

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