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Research Paper

The effects of meditation on the performance and well-being of a company: A pilot study

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ABSTRACT

The positive effects of meditation on individual well-being have been extensively investigated in the last few decades. The impact that meditation can have on the surrounding environment, including on the well-being of nearby non-meditators, has been mainly studied in regards to Transcendental Meditation and, more recently, through the purported phenomenon of "distant healing". The aim of the present study was to observe how a corporate environment would be affected when a small percentage of their employees meditated together. In an Italian surface coating company of 229 employees, 12 workers (5%) were trained in a Tibetan Meditation technique, which they practiced together daily for a period of 3 months. The effects of meditation were measured both in terms of company performance and in well-being of the non-meditators, the latter by using the Profile of Mood States (POMS) and Short Form 36 (SF36) questionnaires. In terms of company performance indexes, the experimental trimester compared to the previous trimester showed improvements in the quality of production (+6.6%), nonconformity of critical products to standards due to human factors (i.e. mistakes) (−42.6%), and in quarterly productivity (+10.5%). Comparing pre to post meditation periods, psychological well-being measures for non-meditators ($N = 217$) showed significant improvement in the SF36 sub-scales of social activities ($t = -2.76$, $p < 0.05$) and limitations in emotional roles ($t = -2.44$, $p < 0.05$), and they showed modest decreases for the POMS subscales of depression ($t = 1.92$, $p = 0.06$) and hostility ($t = 1.88$, $p = 0.06$). These results are in alignment with the hypothesis that meditation beneficially influences aspects of the local environment, warranting further investigation of this phenomenon.

Introduction

Meditation is known to improve the overall well-being of individuals who practice it.[1–3] Many different forms of meditation showed consistent results in terms of psychological and physical benefits and regularity seems to be strictly connected to its effectiveness.[4] Studies on meditation have not only focused on measuring the effects that a meditation practice can have on meditation practitioners, but also on measuring the effects that meditation can produce on the wider environment, including the well-being of surrounding individuals.[5–10] For instance, in the last decades many studies have been conducted on the phenomenon of "distant healing" as a treatment for a variety of medical conditions, suggesting the existence of a transmission of energy between individuals, aimed at creating a condition of well-being.[11,6,7] However, as of today, these studies seem not to provide strong evidence as they show several contradictions in regards to the existence of energy transmission between subjects.[12]

Most of the studies investigating the effects of meditation on the surrounding environment have focused on the practice of Transcendental Meditation (TM). In 1960, the Indian philosopher and physicist Maharishi Mahesh Yogi, founder of TM, suggested the hypothesis that if at least 1% of the overall population meditated at the same time for a recurrent period of time, the quality of life of the world population would considerably improve. This theory is known as "Maharishi Effect" and is defined as "the influence of coherence and positivity on the social and natural environment, generated from the practice of traditional TM and Sidhi meditation".[1] Following this principle, it was estimated that if 7000 people in the whole world meditated at the same time and on a regular basis, this would bring a positive effect globally, but the same principle is thought to be applicable to smaller populations.[13] Extensive research testing this phenomenon began in the 1970s and continues in the present days. Between the 70s and

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the 80s several studies were conducted in the U.S., Canada and India, in order to test the hypothesis that when at least 1% of a given population practiced TM daily, the number of incidents and violent acts occurring in that same population would drastically reduce.[5] A study conducted in 1973 monitored the crime rate across 40 cities, similar for dimension and features, over a certain period of time. Out of the 40 cities, 20 had at least 1% of the population daily practicing TM and represented the "experimental group". The "control group", consisting of the remaining 20 cities, had no intervention. The crime rate of the experimental group showed a reduction of 24% ($p < 0.001$) both at the end of the study and at the follow-up.[14] Similar results were obtained in the districts of Washington, New Delhi and in the Philippines, where criminal rates were found to be reduced by 11% on average ($p < 0.0001$).[14] Several other studies on TM focused on measuring changes in terms of quality of life and harmony at a local, national and international level.[8–10]

However, only a limited number of studies tested the "Maharishi Effect" in corporate environments. A review published by Schmit-Wilk, Alexander & Swanson, highlighted interesting findings in this sense.[15] A percentage of 1% or more of a corporate population daily practicing meditation was reported to positively affect a number of company performance indexes (e.g., number of work-related incidents, absenteeism, economic performance) and organizational well-being indexes, such as organizational culture and company climate, work-related satisfaction and stress levels of employees.[16–18] Based on the available results, Gustavsson & Harung came to the conclusion that if an adequate number of people belonging to an organization practiced TM together for a certain period of time, this would bring changes within the organizational collective consciousness, defined as the "the wholeness that is formed by the members of an organization coming together" or "the sum total of the level of *being* of the members".[19]

The effect of meditation on the surrounding environment seems to have mainly been tested through the practice of TM. However, this is not the only form of meditation that may have an influence on a wider level. For instance, studies on distant healing have looked at other types of compassionate practices, such as Buddhist meditations, prayers and the Therapeutic Touch. In particular, Tibetan Meditation has recently caught the attention of researchers. This form of meditation differs from TM in terms of meditation focus, subject/object relation, procedures and brain paths involved.[20]

Transcendental Meditation vs Tibetan Meditation

Travis and Shear define Maharishi's TM as an *automatic self-transcending* practice, linked to the production of alpha1 brain waves, in which the repetition of a mantra brings to a minimal cognitive control, and therefore to transcending of the procedures of the meditation itself.[20] Differently, the Tibetan Buddhist Meditation is considered a focused attention practice, which entails a voluntary sustained attention and awareness on a specific object to be maintained during the whole practice, until the object becomes the only thing the mind can think of. This process is known to produce gamma and beta2 brain waves.[20] The Tibetan practices can refer to an internal (e.g., the act of breathing) or an external object (e.g., a person or Buddha), but it can also focus on personal feelings and states such as compassion or well-being. Despite the differences in methods and brain patterns' activation, both practices have shown beneficial effects on practitioners and their practice is being studied in terms of effects on external entities.

Only a few studies focused on testing the "Maharishi Effect" in corporate environments and they all tested the practice of TM, showing interesting results as presented in the previous paragraph.[15] However, the same principle of a positive influence on the environment originating from the regular meditation practice of at least 1% of the reference population has not been applied to other forms of meditation (e.g. Tibetan Meditation). In fact, studies of this type have not been found in the existing literature and therefore represent the focus of this pilot study.

The aim of this pilot study was to test the hypothesis that if 1% or more of a corporate population daily practiced a Tibetan Meditation together for a period of time, the whole organization would benefit from the practice. Inside an organization, 5% of employees has trained on a Tibetan Meditation and daily practiced it together for a period of 3 months, while the effects of meditation on company performance and on the well-being of non-meditating employees were measured.

Methods and materials

Sample

The sample was recruited at the headquarters of the multinational corporation Turbocoating Spa, located in Rubbiano di Solignano (Parma, Italy), from April to June 2018. The company operates within the aerospace industry and in the manufacturing of surface coating of gas turbines. It is owned by the United Coating Group, which includes 11 branches located in France, Italy, US and China, that were not included in the study. The headquarters count 229 employees (6 directors, 79 employees and 150 plant workers).

Meditators

The group of meditators ($N = 12$) was initially selected by top management on the basis of individual availability to attend a daily meditation practice and level of trust recognized to the person. This first selection brought to a group of 24 persons, who attended an introductory course aimed at presenting the project. They then had 2 weeks to confirm their interest in taking part in the study. The interested candidates went through a one-to-one interview with the project coordinator, aimed at further assessing their motivation. At last, 12 individuals (9 white-collar employees, 2 blue-collar employees and 1 director) were selected as the group of meditators and they all had no experience in meditation practices. Therefore, the sample of meditators represented 5% of the whole company. They all gave their consensus to take part in the study and were provided with relevant information about the scope of the research.

Non-meditators

The group of non-meditators ($N = 217$) consisted of the remaining employees. Exceptions made for directors, non-meditators were not aware of the aims of the study.

Meditation practice

Training

Meditators attended a 4-weeks training (from February 12th to March 5th, 2018), during which an experienced teacher initiated the group into a Tibetan Meditation practice. The 3 h-long training sessions were held on a weekly basis. In between each session, participants had to maintain a daily independent practice to be conducted at their most convenient time. At the end of the training period, the trainer made sure all meditators had learnt the full sequence and could effectively practice in full autonomy. A follow-up session was conducted on March 19th, 2018, in order to address any remaining doubts.

Meditation sequence

The chosen sequence was a 20-minutes practice coming from the Tibetan tradition and adapted to the specific context. The meditation consisted of imagining beneficial effects directed from the individual towards the whole organization. Following the training period, meditators practiced independently for a period of 3 months (April through June 2018). The meditation was performed in a dedicated room at the company facilities, Monday through Friday, from

Table 1
Company performance indexes referred to the experimental trimester (Q2, April – June 2018) and the previous trimester, (Q1, January – March 2018).

Index	Description	Experimental trimester (Q2)	Previous trimester (Q1)	Difference (%) between Q2 and Q1
Quality of production processes	It evaluates how much the output of some production-related parameters is close to the target, from metallographic test reports. It ranges from 1 to 10.	6.14	5.76	+6.6
Non-conformity coefficient of critical products	It measures the compliance with standards of specific families of products used as case studies. It is based on metallographic tests and is expressed in%.	29%	68%	−42.6
Quarterly productivity coefficient	Revenue per hour worked.	137.08	124.10	+10.5
Weekly machines failures coefficient	Mean of weekly machines failures.	70.46	69.15	+1.9

7:35 am to 7:55 am. The average registered presence during business days resulted to be 82%. The practice was individual (not led by a teacher), but the group meditated simultaneously. Meditators were instructed to repeat the practice also on non-working days, with a daily session to be performed at their most convenient time.

Tools and assessments

In order to assess the effects of meditation on the whole organization, indexes of company performance and well-being of non-meditators were measured.

Company performance indexes

The following company performance indicators were monitored during the experimental trimester (April – June 2018) and compared to the previous trimester (January – March 2018) and, where possible, to the same trimester of the previous year (April – June 2017):

- *Quality of production processes*: evaluates how much the output of some production-related parameters is close to the target, from metallographic test reports. It ranges from 1 to 10.
- *Coefficient of non-conformity of critical products*: measures the rate of non-compliance with standards of specific families of products used as case studies. It is based on metallographic tests. The lower values, the higher compliance.
- *Quarterly productivity coefficient*: company revenue per hour worked.
- *Weekly machines failures coefficient:* total number of weekly machines failures, calculated for the trimester.

Well-being of non-meditators

Well-being of non-meditating employees was assessed through 2 questionnaires: The Profile of Mood States (POMS) and the Short-Form 36 (SF36).[21,22] The Italian versions of both questionnaires were submitted to non-meditators at 3 different times: (1) before meditators started the training (pre-training); (2) at the end of the 4-weeks training (post-training); (3) at the end of the 3-months practice (post-intervention). Data were analyzed using SPSS version 20.0.

POMS

The POMS is a self-report questionnaire used to assess perceived transient mood states. It contains 65 items and five-points Likert-scale responses. Items are sub-classified into six factors: Anxiety/Tension; Depression/Dejection; Anger/Hostility; Vigor; Fatigue; Confusion/Bewilderment. High levels of reliability and validity were reported.

SF36

The SF36 is a self-report questionnaire made of 36 items assessing eight areas of general health as follows: Physical functioning; Role limitations due to physical problems; Bodily pain; General health perceptions; Vitality; Social functioning: Role limitations due to emotional problems; Mental health. Scores are in the range 0–100. High levels of reliability and validity were reported.

Results

Company performance indexes

As shown in Table 1, if compared to the previous trimester (Q1, January through March 2018), 3 out of the 4 company performance indexes showed relevant improvements for the experimental trimester (Q2, April through June 2018). In particular, in comparison with the previous trimester, the *Quality of production processes* index increased by 6.6%, the *Coefficient of non-conformity of critical products* showed an improvement of 42.6% and the *Quarterly productivity coefficient* increased by 10,5%.

The *Coefficient of non-conformity of critical products* was also compared with data from the previous year, showing more stability and lower values during the experimental trimester (Fig. 1). The *Quarterly productivity coefficient* showed the highest record during the experimental trimester (137.08), if compared to quarterly results of the last years, based on data provided by the company's financial department (Fig. 2). The *Quality of production processes* and the *Machine Failures Coefficient* indexes were not comparable to data from the previous years as they were purposively created for the current project.

Well-being of non-meditators

POMS

As showed in Table 2, psychological well-being scores at the POMS showed a decrease at the limit of statistical significance between pre-training and post-training for the subscales of Depression/Dejection ($t = 1.92$, $p = 0.06$) and Anger/Hostility ($t = 1.88$, $p = 0.06$), while there was a statistically significant variation for the variable Confusion/Bewilderment ($t = -2.32$, $p < 0.05$), which slightly increased between the pre-training and the post-intervention. Other subscales showed not particularly relevant changes between pre-training, post-training and post-intervention measurements.

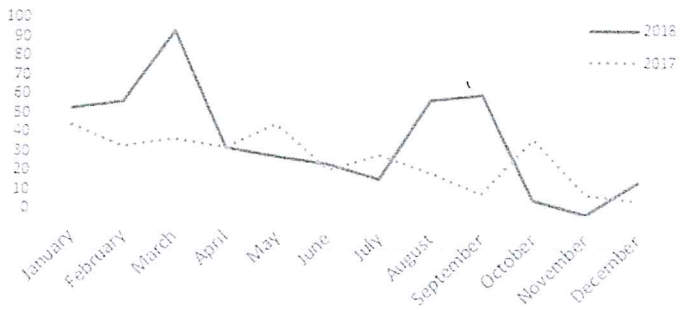

Fig. 1. *Non-conformity coefficient for critical products* index's trends in 2017 and 2018. The Experimental trimester refers to the period April – June 2018.

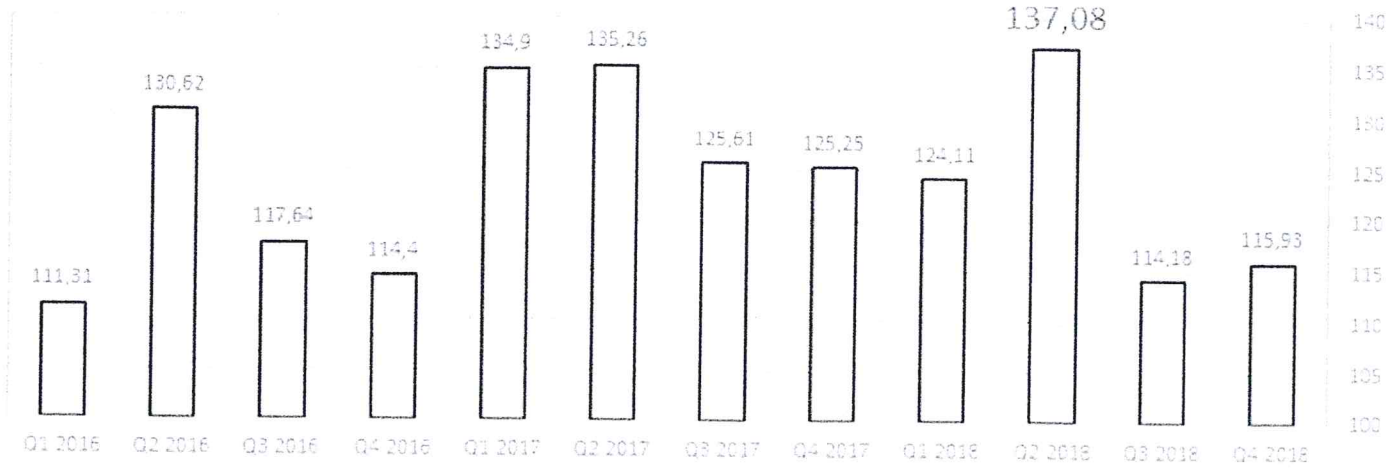

Fig. 2. Variations of *Quarterly productivity coefficient* from 2016 to 2018. The Experimental trimester refers to Q2 2018. Q1 = refers to trimester January - March; Q2 = refers to trimester April – June; Q3 = refers to trimester July – September; Q4 = refers to trimester October – December.

SF36

As shown in Table 3, well-being scores at the SF36 showed a statistically significant improvement between the pre-training and the post-training in the sub-scales of Social functioning ($t = -2.76$, $p < 0.05$) and Role limitations due to emotional problems ($t = -2.44$, $p < 0.05$). The other subscales showed not particularly relevant variations between pre-training, post-training and post-intervention measurements.

Discussion

The impact of a regular meditation practice on the surrounding environment has been studied mainly for what concerns Transcendental Meditation (TM). Some studies on TM within corporate environments are available and have reported interesting results on how a regular TM practice from 1% or more of the corporate population have positively affected a variety of company performance and productivity-related indexes.[15] However, no research has so far been conducted in order to study how an organization can be affected by having 1% or more of its population regularly practicing a Tibetan Meditation. Our pilot study has therefore focused on testing the hypothesis that when 1% or more of a corporate population practiced Tibetan Meditation on a regular basis, the whole organization can benefit from this in terms of company performance and well-being of surrounding, non-meditating employees. The results of this pilot study have highlighted very encouraging results in regards to the measured company performance indexes, in particular for the 3 indexes linked to human activities (*Quality of production processes*, *Coefficient of non-conformity of critical products*, *Quarterly productivity coefficient*). These 3 parameters have considerably improved during the experimental trimester, compared to the previous trimester and the previous year. In particular, the most remarkable result concerns the *Coefficient of non-conformity of critical products* (−42%, Table 1), which indicates a substantial improvement in the quality of some of the key products of the company. Also the *Quarterly productivity coefficient* shows very interesting results recorder in the experimental trimester as, for the company, it represented the absolute highest record in terms of company productivity if compared to all trimesters of the same and previous years. Comparing results not only to the previous trimester, but also to the same trimester of the previous year has in fact allowed controlling possible biases related to seasonal oscillations. It is interesting to notice how only indexes related to human activity were impacted positively, while the index related to machine-activity (*Weekly machines failures coefficient)* has not recorded relevant variation and has rather shown a slight increase, which could be explained as random oscillation. This fact could suggest that meditation practice might present a selective impact to human-related activities.

Data on the well-being of non-meditating employees light variations between the pre-training and the post-intervention, while more significant variations were recorded between pre-training and post-training measurements. At post-training, in fact, the SF36 subscales of Social functioning and Role limitation due to emotional problems and the POMS subscales of Depression/Dejection and Hanger/hostility show, respectively, scores statistically significant (the first two) and at the limit of statistical significance (the second two). Differently, the post-intervention shows only one statistically significant score, related to the POMS subscale of Confusion/Bewilderment, which remained stable between pre-training and post-training and increased at the post-intervention. This data suggest that the training could have represented a form of monitoring and a positive solicitation in regards to the regularity of the meditation practice. Nevertheless, the attendance of the daily practice after the training showed high scores (82%).

Some limitations of this pilot study are represented by the fact that, due to the corporate organizational reasons, the effects of the

Table 2
Mean scores at the POMS for the non-meditators' group ($N = 217$).

	Pre – training	SD	Post – training	SD	t_1	p_1	Post – intervention	SD	t_2	p_2
Tension/Anxiety	46.07	9.36	44.57	9.10	1.69	0.09	48.04	12.19	−1.54	0.13
Depression/Dejection	48.35	9.76	46.42	10.75	1.92	0.06	50.27	12.71	−1.27	0.20
Anger/Hostility	50.38	11.63	48.38	10.65	1.88	0.06	52.68	15.57	−1.20	0.23
Vigor/Activity	59.60	10.94	60.23	9.21	1.85	0.67	58.74	10.29	0.89	0.37
Fatigue/Inertia	48.78	10.92	47.22	9.30	4.13	0.12	50.88	13.16	−1.43	0.16
Confusion/Bewilderment	42.82	8.91	42.07	8.97	2.83	0.46	45.64	13.56	−2.32	0.02

SD = standard deviation; p_1 = difference pre-training/post-training; p_2 = difference pre-training/post-intervention.

Table 3
Mean scores at the SF36 for the non-meditators' group ($N = 217$).

	Pre – training	SD	Post – training	SD	t_1	p_1	Post – intervention	SD	t_2	p_2
Physical functioning	93.56	11.53	93.97	12.15	−0.47	0.64	93.52	14.31	−0.16	0.87
Role limitations due to physical problems	85.53	26.29	85.42	26.63	−0.19	0.85	80.08	33.18	1.27	0.20
Bodily pain	76.55	24.91	81.22	22.68	−1.63	0.11	78.14	25.74	−0.64	0.52
General health perceptions	71.69	15.90	73.40	15.59	−0.77	0.44	71.87	19.65	−0.15	0.88
Vitality	65.68	17.87	67.98	15.90	−1.49	0.14	61.95	18.66	1.42	0.16
Social functioning	73.25	23.02	79.48	19.88	−2.76	0.01	73.74	23.80	−0.36	0.72
Role limitations due to emotional problems	81.65	31.51	88.37	25.13	−2.44	0.02	81.16	33.73	−0.18	0.85
Mental health	73.38	17.37	76.31	16.49	−1.52	0.13	72.44	18.62	0.44	0.66

SD = standard deviation; p_1 = difference pre-training/post-training; p_2 = difference pre-training/post-intervention.

meditation on well-being have been verified at a group level. In future studies, the phenomenon will be studied under more controlled conditions.

Conclusions

The current pilot study aimed at investigating possible changes within an organization when at least 1% of its population practiced Tibetan Meditation together, on a regular basis, for a period of 3 months. The changes were considered in terms of company performance and well-being of non-meditating colleagues. Encouraging results were observed in most of the considered company performance indexes related to human factors. Improvements in some dimensions related to well-being were observed at post-training (for the dimensions of Social functioning, Role limitations due to emotional problems, Depression/Dejection and Anger/Hostility), while results showed lighter changes at the post-intervention measurement. The intention of this pilot study was to conduct a first basic investigation as a foundation for further meditation-based interventions to be structured under more controlled conditions, with the aim of promoting positive effects in the workplace, in terms of employees' well-being and company productivity.

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