

# **DEVELOPING FIELD INDEPENDENCE IN CHINESE LANGUAGE SECONDARY SCHOOL STUDENTS THROUGH THE TRANSCENDENTAL MEDITATION PROGRAM**

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## **Abstract**

Field independence is the ability to focus sharply (analyse) while maintaining broad awareness (synthesize). Its importance for student development is widely recognized by educators. Published studies show significant growth of field independence in students through the regular practice of the Transcendental Meditation technique. One such study evaluated benefits to Chinese language students. To explore this area further, this current study was conducted to evaluate changes in field independence for secondary school students (grade level 7; average age=13 years) practicing the Transcendental Meditation technique in a private Mandarin language secondary school in Malaysia. All students, faculty, and administrators practice the Transcendental Meditation technique twice-daily as part of the regular school day. The purpose of this study was to evaluate change in students' field independence, using the Group Embedded Figures Test (GEFT). Thirty-one students participated in this longitudinal study, with pretesting prior to learning the Transcendental Meditation (TM) technique and post testing five months later. Students practiced the TM program at school twice a day for about 15 minutes. Results indicated significant improvement in field independence over five months due to students' practice of meditation. Administrators and teachers are encouraged to incorporate practice of TM into the curriculum to enhance students' cognitive development.

**Keyword:** Transcendental Meditation, field-independence, meditation, cognitive style

## Introduction

Field independence signifies the skill to make an independent perceptual judgement while not being diverted by the context (Goodenough, 1976). Stated simply, one is able to see “the tree and the forest.” Field independence has been associated with a greater ability to assimilate and structure experience, greater organization of mind and cognitive clarity, improved memory, and greater creative expression. Field independence is also related to a “stable sense of well-being or self-concept that operates as an internal frame of reference” (David, 1981). That means field independent people are less likely to be influenced by others while making decisions—they are more self-sufficient and less dependent on their physical and social environment or *field*. Moreover, they are more calm in uncertain circumstances. Psychophysiological studies shows a connection between greater field independence and better physiological and personality stability (Silverman, 1967).

The Group Embedded Figures Test (GEFT) is a measure of cognitive style—testing the ability to identify common geometric shapes in a larger design (Vitkins, 1971). This simple assessment yields a wealth of information about field dependence-independence. GEFT was developed to study cognitive functioning, but it has become a recognized tool for exploring analytical ability, social behaviour, body concept, preferred defence mechanism and problem-solving style as well as other areas.

The purpose of this study was to measure the effects of Transcendental Meditation on field independence in middle school students in Malaysia. This was the first study to systematically evaluate this program in a Mandarin-speaking school in Malaysia.

## Background

This private Mandarin school has implemented TM since August 2018. Over a total of 300 students, teachers and administrators have learned TM at this school since it was implemented into the school’s curriculum. The principal and administrators noticed a positive change in the school environment and therefore were interested in documenting the transformation by using a standardized measure of cognitive performance.

Previous research on the TM program has shown improvement in student cognitive performance in other countries. For example, in a random assignment study with 362 high school students in Taiwan showed a substantial improvement in field independence in meditating students compared to controls over a school year (Kam &

Orme-Johnson, 2000). In a second study, the effects of the TM technique were evaluated on working memory and field independence in 66 U.S. middle-school students. Results showed that the TM technique compared to a matched control group had a significant effect on both working memory and field independence over a 3-month intervention period (Dillbeck (1981). In a third study in U.S. university students field independence was shown to improve due to TM practice over a multi-year period (Dillbeck et al, 1986).

The Transcendental Meditation® (TM) technique was introduced to Southeast Asia from India by Maharishi Mahesh Yogi in 1958. It is an effortless, natural, non-religious technique that students learn in a few short lessons and practice while sitting comfortably with their eyes closed. Worldwide, students in hundreds of educational institutions in over 45 countries, participate in the twice-daily practice of the TM technique.

During the practice of the TM technique, the student sits comfortably and meditates following standard instructions given by a certified teacher of the TM technique. As the student practices, his mental activity settles down until he transcends the activity of thinking and experiences consciousness in its pure state. In this state, consciousness is aware of itself only. Maharishi calls this state “Transcendental Consciousness” (Roth, 1987). Maharishi, in his book, the Science of Being and Art of Living, explains “effortlessly and spontaneously the mind flows to ever more refined and charming levels of the thinking process, until it transcends (goes beyond) even the finest aspect of thought to experience pure Being in the state of Transcendental Consciousness” (Maharishi, 2001, p. 372).

Research has found two distinctive physiological markers during the practice of TM that signify *transcendence*. The first marker is global alpha1 coherence and the second marker is breath suspension indicating deep rest. Studies show that during TM, global alpha1 coherence is seen across the whole cortex. Researchers refer to this unique phenomenon as *total brain functioning* (Travis, 2010). In this state, it is not that the total brain is active, the total brain is calmly awake. Studies also show natural breath suspension during the practice of TM, which indicates the body is in a calm and restful state (Badawi 1984). These two markers signify a unique mind-body state during TM where the brain is awake and the body is restful. Researchers call this unique mind-body state “restful alertness”, which is hypothesized to be a fourth major state of consciousness (beyond waking, dreaming, and sleep states (Wallace, 1970; Wallace, 1989).

## **Method**

Change in GEFT scores from baseline to posttest were analyzed using the dependent t-test. Two-tailed p values were used in all analyses.

## **School Site**

The students participating in this study were from a private school in the north of Malaysia located in Alor Setar, in the state of Perlis. This school is Mandarin-speaking school where all students are Chinese. Mandarin is their first language. This school, with a current enrollment of over 200 students, has an open admission policy unlike any other private Mandarin-speaking school in the same state. All other such schools adhere to strict student admission policies based on previous grades and behavior.

## **Participants**

Thirty-one students (grade level 7; average age=13; 18 boys and 13 girls), newly enrolled at the school, participated in this study. All other students had learned the TM technique in the previous year. Before learning the TM technique, written permission from parents was obtained.

## **Transcendental Meditation Program**

Students were taught the TM technique by certified instructors in a standard seven-step course. Students then practiced their TM technique for 15 minutes twice-a-day, morning and afternoon, as part of their daily school routine. The seven-step instruction included: 1) an introductory lecture (1 hour) that discussed the benefits of the program, 2) a preparatory lecture (1 hour) that presented the mechanics of how to practice the technique, 3) a brief personal interview with the teacher (10 minutes). Then the instruction (steps 4-7) took place on four consecutive days about an hour each day. Step 4, was a personal instruction session and then steps 5-7 were group meetings to verify the correctness of the practice and to provide additional knowledge about the practice. Students then practiced their meditation program in school at the beginning and end of the school day, supervised by a classroom teacher or TM instructor. Students were encouraged to practice at home over the weekend and on school holidays.

Besides incorporating the twice-daily practice of the TM technique, no change in the curriculum or teaching methods were made in the school before or during the research period. Students practiced the TM technique for 15 minutes together in their first class of the day, then they practiced together for the same time when the last class

was finished at the end of the school day. These classroom groups were supervised by a certified TM instructor or a trained faculty member.

### **Outcome Measure**

Field independence, using the Group Embedded Figures Test (GEFT) was measured at pretest (prior to leaning meditation) and after five months. The GEFT was designed by Witkin (1971) to assess the continuum of “field dependence – independence” (David 1981). Improvement on the GEFT was taken as a marker of the growth of field independence—the ability to dis-embed information from context or surrounding gestalt. The test asks the participant to spot a simple form within a more complex figure.

The test was administered in a group format. Instructions are given right before the test and the examiner allowed students to read and understand the direction and further review points to keep in mind. The test consisted of two sections, part A and part B, with each part including 9 items to solve. Baseline test results were collected on February 2019 and post-test results were collected on August 2019.

### **Statistical Analysis**

Dependent t-tests were used to analyze changes in GEFT scores from baseline to posttest. Two-tailed p values at the .05 level were used for all analyses, with confidence intervals reported for all analyses. Table 1 below shows the pre and post results from Part A of the test. and table 2 shows the pre and post results from Part B of the test. Table 3 compare the pre and post results from both Part A and B test.

Table 1

Result of GEFT Part A

Variable	T-test for Dependent Samples (Malaysia school data Febuary 2019)						
	Marked differences are significant at $p < .05000$						
	Mean	SD.	N	Diff.	Std.Dv. Diff.	t	df
EmbeddedFiguresApre	1.225806	1.359158					
EmbeddedFiguresApost	2.064516	1.806202	31	-0.838710	1.439833	-3.24325	30

Variable	T-test for Dependent Samples (Malaysia school data nov 2019)		
	Marked differences are significant at $p < .05000$		
	p	Confidence -95.000%	Confidence +95.000%
EmbeddedFiguresApre			
EmbeddedFiguresApost	0.002896	0.310575	1.366845

Table 2

Result of GEFT Part B

Variable	T-test for Dependent Samples (Malaysia school data August 2019)						
	Marked differences are significant at $p < .05000$						
	Mean	Std.Dv.	N	Diff.	Std.Dv. Diff.	t	df
EmbeddedFiguresBpre	2.096774	1.921021					
EmbeddedFiguresBpost	2.870968	2.362794	31	-0.774194	1.647416	-2.61654	30

Variable	T-test for Dependent Samples (Malaysia school data nov 2019)		
	Marked differences are significant at $p < .05000$		
	p	Confidence -95.000%	Confidence +95.000%
EmbeddedFiguresBpre			
EmbeddedFiguresBpost	0.013776	0.169917	1.378471

Table 3

## GEFT Figures Total

Variable	T-test for Dependent Samples (Malaysia school data November 2019)						
	Marked differences are significant at $p < .05000$						
	Mean	Std.Dv.	N	Diff.	Std.Dv.	t	df
EmbeddedFiguresTotalpre	3.322581	3.155810					
EmbeddedFiguresTotalpost	4.935484	3.898166	31	-1.61290	2.564858	-3.50127	30

Variable	T-test for Dependent Samples (Malaysia school data nov 2019)		
	Marked differences are significant at $p < .05000$		
	p	Confidence -95.000%	Confidence +95.000%
EmbeddedFiguresTotalpre			
EmbeddedFiguresTotalpost	0.001472	-2.55370	-0.672106

Results indicated a significant improvement in student fields independence over the 5-month TM program. The Group Embedded Figures Test (GEFT) Total score increased from a mean of 3.32 (SD=3.16) at baseline to a mean of 4.94 (SD=3.90) at five-months ( $t(30)=3.50$ ;  $p=.001$ ; 95% CI 0.67, 2.55).

Increases were observed in both GEFT Parts A and B. For GEFT Part A at baseline students showed a mean score of 1.23 (standard deviation

(SD)=1.36) at baseline which improved to 2.06 (SD=1.81) at five months; a mean change of 0.83 ( $t(30)=3.24$ ;  $p=.003$ ; 95% CI 0.31, 1.37). For GEFT Part B at baseline students exhibited a mean score of 2.10 (SD=1.92) which improved to 2.87 (SD=2.36) at five months; a mean change of 0.77 ( $t(30)=2.62$ ;  $p=.014$ ; 95% CI 0.17, 1.38).

## Discussion

Results show an overall average increase of 1.62 on the GEFT, corresponding to a 49% improvement in cognitive development for field independence. This finding is consistent with previous research with the Transcendental Meditation program, including the only other study with Mandarin-language students conducted outside of Malaysia.

Qualitative reports from students support the data from the study. A student reported, "I feel less tired and sleepy, and I am able to focus more in class. Another student expressed, "I have better relationship with my classmates and teachers." These behaviors suggest a growing stable internal frame of reference.

The principal of the school reported her experience after the students had learned the TM technique: "It helps the students to increase their concentration power and their intelligence." Moreover the principal reported that not only did students' academic performance improve but the entire school environment improved. She commented, "The school has become more harmonious and peaceful." She experienced that the relationship between the teachers and students became better in ways that suggest improved field independence—teachers and students are more easily able to consider each other's viewpoint. At the same time, they are less easily persuaded to do something wrong. Ninety percent of teachers and administrators in the school expressed support for continuing the program on a regular basis throughout the school year as part of the normal school routine.

This pilot study will provide the basis for future research projects in Malaysia with Mandarin-speaking students. Because the results are consistent with prior controlled school studies using the same test instrument and the same standard TM treatment (Kam & Orme-Johnson, 2000; Dillbeck (1981), it is suggested that improvement in field independence was not due to possible testing effects, but was due to the effects of treatment. The five-month time period between testing sessions also helps mitigate potential practice effects. Future studies are encouraged to include larger numbers of students from a wider range of grade levels and ages to enhance generalizability. The addition of an active control group will help control for other possible confounds such as instructor time and attention. Future research is encouraged

to explore possible relationships between field independence and academic performance and with student social behavior.

## Conclusion

This study indicates that students' practice of the TM technique positively influences the growth of field independence. It supports previous findings with TM in school students and extends these findings to Mandarin-language students in Malaysia. Administrators and teachers are encouraged to add this program to their school's standard curriculum to provide students with a new and effective tool for promoting their own potential.

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