

Bial Foundation Grant 174/06

Final Report

Attention training and the feeling of being stared at

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Introduction

Experiences of profound alterations in consciousness can result in long-lasting shifts in one's worldview (Schlitz, Vieten & Amorok, 2008). Based on extensive interviews, we have found that these transformative experiences frequently involve moments of significantly enhanced intuition and interpersonal sensitivity. Similar enhancements are reported in most traditional religious and spiritual practices, and they can also be found in many modern eclectic transformative practices. While there is no lack of anecdotes and testimonials to support claims of enhanced intuition, few controlled studies have been published to confirm them (Delaney, Morris & Watt, 1999; Morris, 1999).

Experiments conducted in our laboratory suggest that transformational practices, including meditation and attention training, may indeed enhance unusual capacities such as generating physiological coherence between individuals at a distance (Radin et al, 2008), influencing living systems at a distance (Radin, Taft & Yount, 2004; Yount et al, 2004), and manifesting mind-matter interactions at the quantum level (Radin, 2008). Other investigators have reported similar results with advanced meditators vs. non-meditator controls in precognition tasks (Roney-Dougal & Solfvin, 2006, 2008).

To test the claim that transformational practices may lead to enhanced psi experiences, we conducted an experiment with two groups, one with extensive attention training via years of daily meditative practice, and another with no systematic attention training. The experiment involved a controlled test of the "feeling of being stared at." In such a test, a sender (S) is typically asked to either "send" or "not send" focused attention towards a distant receiver (R) in a randomly determined order. The results of the test are evaluated by examining R's guessing

accuracy in the two conditions. Previously experiments of this type have been conducted in a range of contexts, from naturalistic (Sheldrake 1998; Sheldrake 2001) to rigidly controlled laboratory designs (Schlitz and Braud, 1997; Radin and Schlitz, 2005; Schlitz, Wiseman, Milton and Radin, 2006).

Studies conducted in natural settings have had the advantage of more closely matching the real world experience of being stared at. Unfortunately, those studies also employ methods where potential methodological flaws, such as subliminal cuing, recording errors, or cheating are more difficult to definitively exclude. More carefully designed studies which do exclude such flaws require special laboratory conditions that can limit the ecological validity and restrict the number and type of individuals that can be tested.

To help overcome these limitations, we developed a web-based technique that allows for a controlled distant staring experiment to be performed over the Internet. The method allows S to view the live video streaming image of R, who can be located anywhere (with access to the Internet). The program randomly assigns staring and non-staring trials based on a true random source, and it automatically records R's guesses. This makes it possible to recruit special individuals for distant staring experiments, and to allow both S and R to take the test under their preferred and most comfortable conditions. Of course, to maintain experimental controls in a formal test, at least one of the two individuals involved in the test must be monitored to exclude possible collusion.

This project had two overall aims: First, to test how engagement in transformative practices correlates with an objective measure of intuition; Second, to further develop and validate a novel internet-based distant staring measurement tool that can be used to test intuition in future research.

Method

In the original proposal for this experiment, we planned to test 40 participants who were students of an "Integral Transformative Practice" (ITP) training program held in the San Francisco Bay Area (Leonard & Murphy, 2005). We planned to have pairs of these participants take part in the staring experiment before they began their training program, every three months, and after completion of the year-long program. Forty additional people, matched for age and gender, who were not participants in any intensive attention training program would also be recruited from the population of IONS members as controls, and tested at the same time points as the trained group.

Unfortunately, while initial recruitment of the ITP participants seemed promising, in practice it proved to be exceptionally difficult. After six months it became clear that we could not recruit 40 ITP participants, so we revised the original plan into a more manageable design that would

examine claims of enhanced intuitive abilities due to attention training, but across rather than within groups.

To do this, we recruited 16 adult long-term meditators and 16 adult non-meditators. For the meditators, we selected people who had been practicing the Transcendental Meditation TM-Sidhi method for a minimum of 10 years. We focused on this one meditative tradition to ensure that the trained group would represent a uniform transformational method. Transcendental Meditation is described as a technique that “opens the awareness to Transcendental Consciousness, which is the basis of everyone’s awareness. The TM-Sidhi program cultures the ability to think and act from this level.”¹ The control participants were adults who had never been engaged in a systematic meditative or attention-training program.

Web-Staring Procedure

Figure 1 is a screen shot of the web page viewed by the receiver (R) in this experiment. It informs R that a trial is in progress without indicating whether the distant sender (S) is presently viewing their image or not. Figure 2 is a screen shot of the live video image of R as viewed by S during a randomly assigned sending period. Five seconds after the trial begins, R sees a count-down timer and has 15 seconds to respond “yes” or “no,” i.e. they thought they were being stared at, or not. If no response was received within 15 seconds, the trial was recorded as a pass. If R did respond, feedback was provided to indicate that the response was correct or incorrect. S also saw this feedback. The assignment of staring vs. non-staring conditions per trial was determined by a true random process (atmospheric noise) available automatically via a web service.²

¹ <http://www.mum.edu/tmsidhicourse/> as of October 13, 2008.

² <http://www.random.org/>

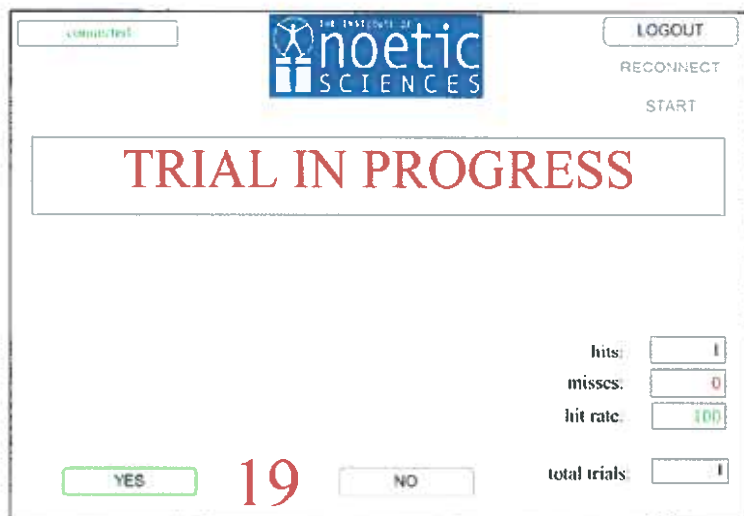


Figure 1. Receiver's screen in the web-based distant staring test, with the "Yes" button highlighted in response to the question, "Are you being stared at?"



Figure 2. Sender's screen in the web-based distant staring test, showing the live video streaming image of the distant Receiver.

Hypotheses

Hypothesis 1: Meditators would perform better on a distant staring test than non-meditators, due to enhanced intuition abilities gained as a result of extensive attention training.

Hypothesis 2: Meditators would report lower levels of stress than non-meditators. A "Perceived Stress Scale" was used to assess level of stress.

Hypothesis 3: Meditators would report higher levels of self-transcendence than non-meditators. The Cloninger Self-Transcendence Scale was used to assess perceived self-transcendence.

Hypothesis 4: Participants who expected that they would perform better on the staring task would perform better than those who did not. Expectations were assessed by asking four related questions: (1) How would you rate your ability to perceive someone staring at you (below average, average, above average); (2) How well do you think you will do in this test (yes, no); (3) Have you previously experienced being stared at (yes, no); and (4) Do you have psychic abilities (yes, no).

Power analysis

Each participant contributed five sessions of 20 trials each in one setting. Then R and S switched roles. A total of 8 pairs of participants per condition ($N = 16 \times 100$ trials each) would thus generate 1,600 total trials for the meditator and non-meditator group. Prior to this study, a power analysis based on a meta-analytic effect size estimate of $p_1 = 0.54$ (for tests of this type conducted in naturalistic settings; Radin, 2005), and where the null hypothesis was $p_0 = 0.50$, indicated that this sample size should be sufficient to produce a significant effect at $\alpha = 0.05$ with power = 0.89. It was unknown whether the present web-based method could be regarded as a naturalistic setting, so there was some uncertainty about whether the power analysis was valid for this particular design.

Results

Participants

The TM meditators averaged 23.8 years of TM-Sidhi practice, and practiced regularly (meaning daily) on average 84% of the time. Nine of the 16 non-meditators reported occasionally meditating or praying, but none had a strict daily practice. One meditator reporting taking anti-depressants for a brief period 10 years prior to the experiment; two of the non-meditators had taken anti-depressants or anti-anxiety medications some years before the experiment, and one was currently taking an antidepressant. The two groups showed no differences in self-rated ability to perceive someone staring at them ($p = 0.34$, two-tailed), in how well they thought they would do in the test ($p = 0.24$, two-tailed), or in self-assessed psychic abilities ($p = 0.28$, two-tailed). However, the non-meditator group reported having had the feeling of being stared at significantly more than the meditators ($p = 0.03$, two-tailed).

Hypothesis 1

Hypothesis 1 predicted that meditators would perform better on a distant staring test than non-meditators. The overall results were contrary to the prediction (see Table 1): The control group performed slightly better than the meditation group ($p = 0.13$, two-tailed).

	Control	Meditation
Hits	823	764
Trials	1,587	1,554
passed trials	13	46
hit rate	51.9%	49.2%
z score	1.48	-0.66

Table 1. Hit, trials, hit rate, and associated z score for the two groups, along with number of passed trials.

Figure 3 shows the time-course of the average performance over the 100 contributed trials per person, separated by group. It indicates that on average the meditation group performed closely to chance expectation over the entire sequence of 100 trials, but the control group progressively improved up to trial 60, at which point the hit rate peaked at 55.2% and $z = 3.2$ ($p = 0.001$, two-tailed), then their performance declined over the subsequent two 20-trial runs. Similar serial position effects, reflecting enthusiasm about a novel task followed eventually by boredom, are commonly observed in the experimental psychology literature (Dunne et al, 1994; Shoben et al, 1989; Thompson, 1994).

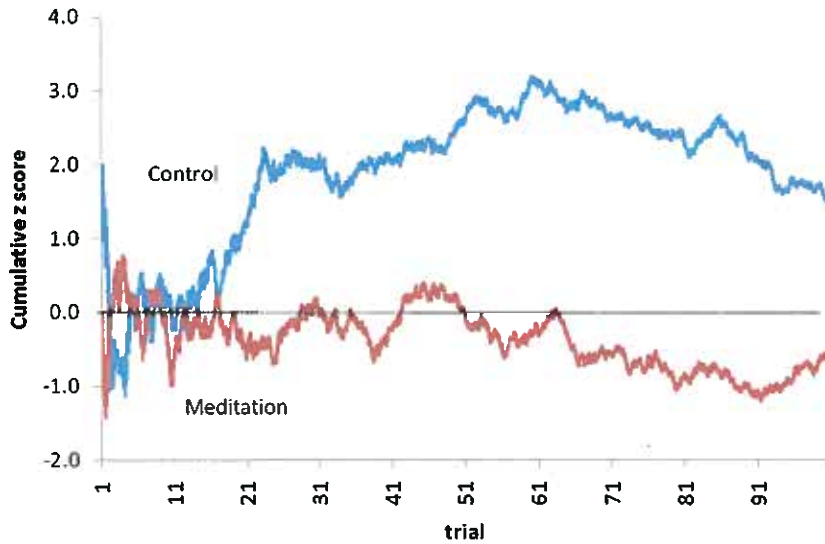


Figure 3. Cumulative z score for the control and meditation groups.

It might be noted that in most of the previous staring studies conducted in naturalistic settings, only one or two runs of 20 trials typically were conducted by non-meditators. In the present case, if the experiment had stopped after a single run of 20 trials, then the control group would have achieved a hit rate consistent with the 54% hit rate observed in previous tests. This is shown in Figure 4, which plots the cumulative hit rate in the two groups by trial. It indicates that the control group systematically improved throughout the first 20-trial run, then maintained about a 55% hit rate for two more 20-trial runs, and only then did their performance decline. By contrast, the mediation group performance was close to chance throughout the entire session.

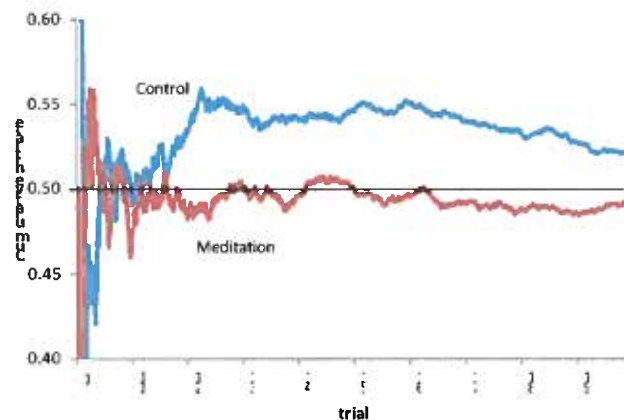


Figure 4. Cumulative hit rate for the control and meditation groups.

Because of the hit rate differences in the two groups, it is instructive to see whether there might have been any systematic differences in how the participants responded. Figure 5 shows that the meditation group was biased to respond “yes” to the question “Are you being stared at?” This bias was consistently maintained throughout their five 20-trial sessions. By contrast, on average the control group exhibited a strong “yes” bias for the first 10 trials, then switched to a strong “no” bias for the next 30 trials, and then switched again to “yes” for the remaining 60 trials. On the one hand this suggests that the control group was more self-conscious about their guessing behavior than the meditator group, but on the other it may reflect a fundamental difference in how the meditators perceived another person’s attention directed towards them. That is, in a transcendent, unitary state where presumably all minds mingle, perhaps the meditators are always aware of the presence of other minds.

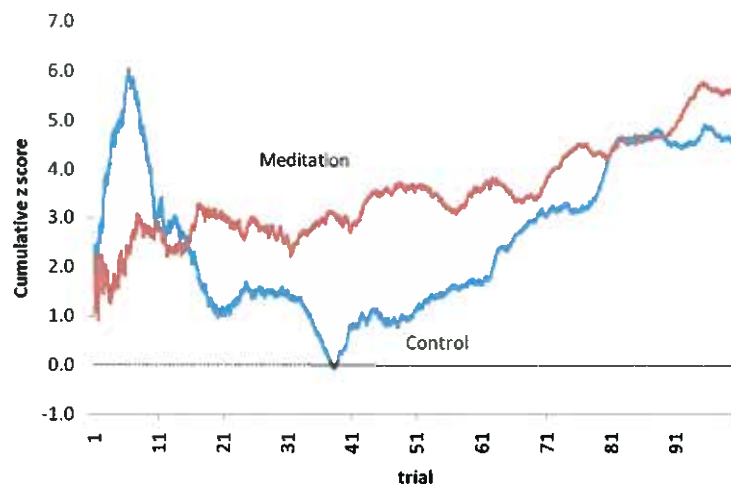


Figure 5. Cumulative effects of response bias, in terms of z scores, for the two groups.

Given the response biases, if the sequence of targets coincidentally corresponded to the same biases, then this might have resulted in a spuriously high hit rate (especially in the control group). Figure 6 shows that overall there were no systematic target biases in either condition (otherwise the z score curves would have become progressively more positive, or negative).

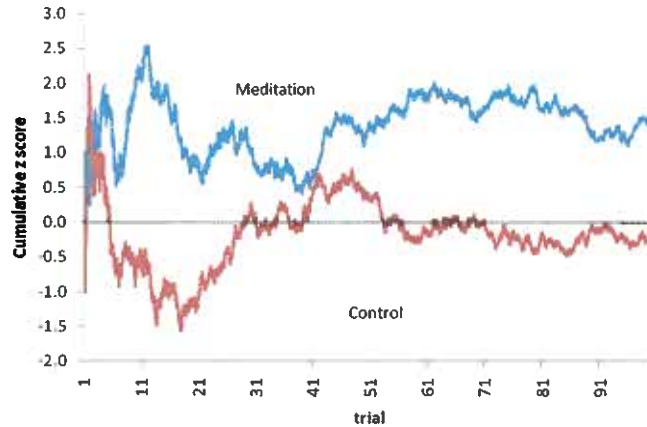


Figure 6. Cumulative results for target type (staring vs. not staring). Positive z scores in this graph correspond to assignment of the staring condition, negative to not-staring.

To explicitly test whether the sequence of staring/no-staring conditions was sufficiently random, we examined the autocorrelation of the original sequence of targets. Figure 7 shows these autocorrelations, with 95% confidence intervals, up to lag 20. This indicates that the trial sequence was adequately random, and thus the higher z scores observed in the control condition are not due to an artifact.

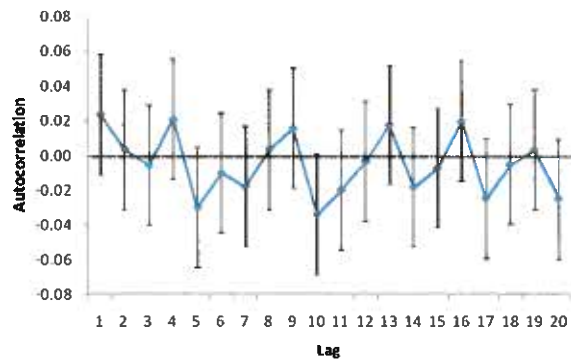


Figure 7. Autocorrelations of original target (staring vs. not-staring) assignments, with 95% confidence intervals.

Hypotheses 2 and 3

Hypothesis 2 predicted that meditators would reported lower levels of stress than non-meditators, but as shown in Table 2 they did not (a higher score means higher stress), but non-significantly ($p = 0.27$, two-tailed). Hypothesis 3 predicted that meditators would report higher levels of self-transcendence than non-meditators, and this was confirmed ($p = 0.0002$, two-tailed).

Group	PSS	CSTS
Control	8.3	10.1
Meditation	10.2	13.4
p (two-tailed)	0.27	0.0002

Table 2. Average scores and two-tailed t-test results for the *Perceived Stress Scale*, and *Cloninger's Self-Transcendence Scale*.

Hypothesis 4

Hypothesis 4 predicted that participants who had higher expectations of performing well would in fact perform better. There were no significant differences between the two groups on the question, “Do you believe you will do well in this experiment?”, but as shown in Figure 8 this expectation did predict performance. The overall number of trials (not counting passed trials) contributed in the “no” category, and pooled across all participants in both groups, was 779, and in the “yes” category 2,324.³ For ease of comparison the cutoff trial in Figure 8 is shown at trial 779. At that point the difference between the two curves is significant ($z = 2.6$, $p = 0.009$, two-tailed). Comparison of the terminal endpoints between the two conditions remains significant ($z = 2.2$, $p = 0.3$, two-tailed). This finding is consistent with the well known “sheep-goat” effect (Lawrence, 1993; Schmeidler, 1945).

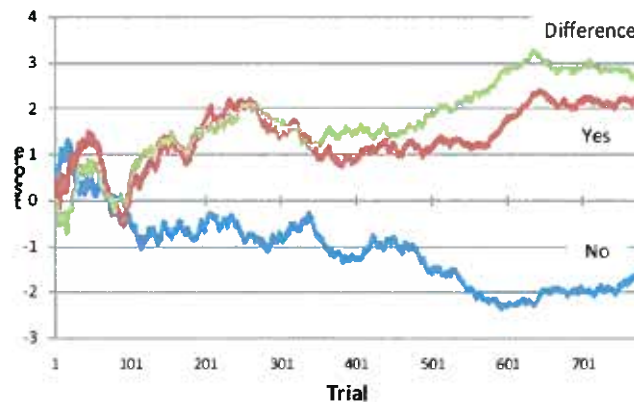


Figure 8. Expectation effect I. Cumulative t-score and difference for successive trials associated with people responding “yes” or “no” to the question: Do you believe you will do well in this experiment?

³ The number of trials in each group varied from one question to the next because a few participants failed to answer all of the expectation questions, and because some trials were passed.

Similarly, Figures 9 and 10 show cumulative t-scores for successive trials associated with people responding to the question, “How would you rate your perceived ability to detect distant staring?”, by answering *above average* (N = 594, terminal z = 1.89), *average* (N = 1951, terminal z = 0.93), or *below average* (N = 300, terminal z = -1.73). This too supports the expected sheep-goat effect with significant terminal z scores for people responding with “above average” and “below average.”

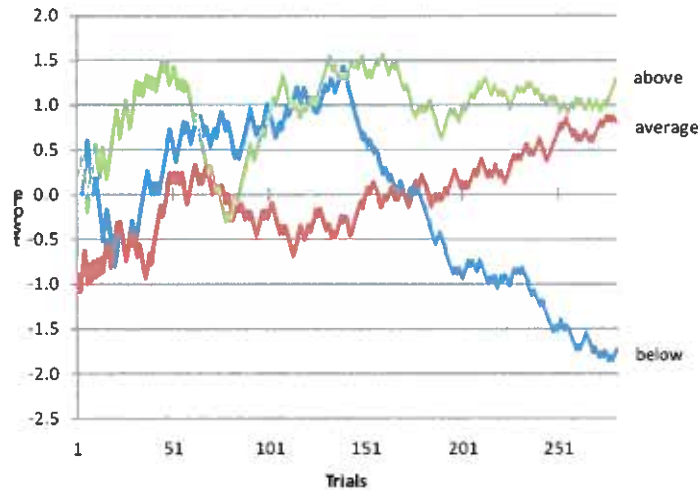


Figure 9. Expectation effect II. Cumulative t-score for successive trials associated with people responding the question: “How would you rate your perceived ability to detect distant staring?”

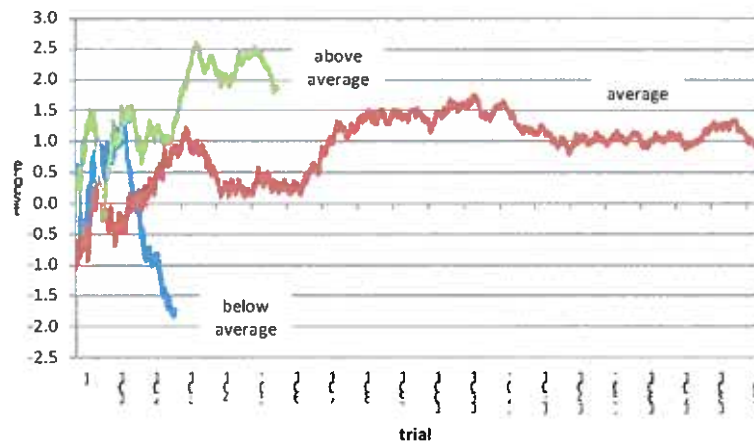


Figure 10. Expectation effect II. Same data as in Figure 9, but showing all data.

Figure 11 shows cumulative t-scores for successive trials associated with responses to the question, “Have you had experience with the feeling of being stared at?”, with *yes* (N = 2,080, terminal $z = 1.1$), or *no* (N = 870, terminal $z = -0.68$). Again, we see evidence for the sheep-goat effect.

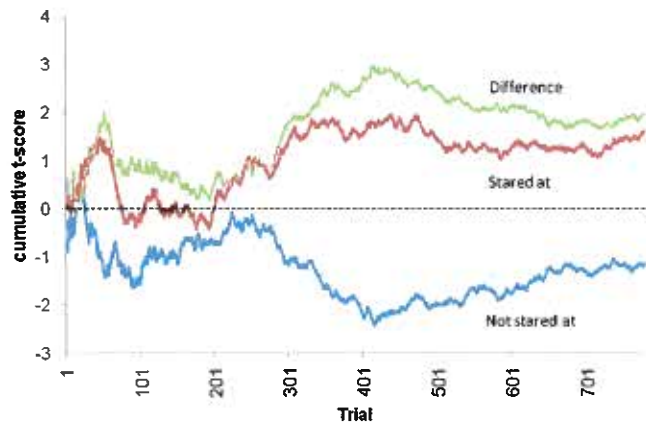


Figure 11. Expectation effect III. Response to the question, “Have you had experience with the feeling of being stared at?”

People responding *yes* to the question, “Do you think you have psychic abilities?”, contributed N = 2,044 trials and achieved a terminal $z = 0.51$. Those responding with *no* contributed N = 1096 trials and a terminal $z = -0.30$. Again, this result is consistent with a sheep-goat effect.

Finally, the four expectation questions were summed and the two groups were examined separately to see whether the sheep-goat expectation effect would persist within the two groups. Figure 12 shows the result for the control group and Figure 13 for the meditation group. In each case the low expectations were those trials associated with participants who had the lowest summed expectancy score, and high expectations were the same for the highest summed expectancy score. The graphs indicate that both groups did show the expected split based on their expectations, but the control group exhibited a stronger differential effect.

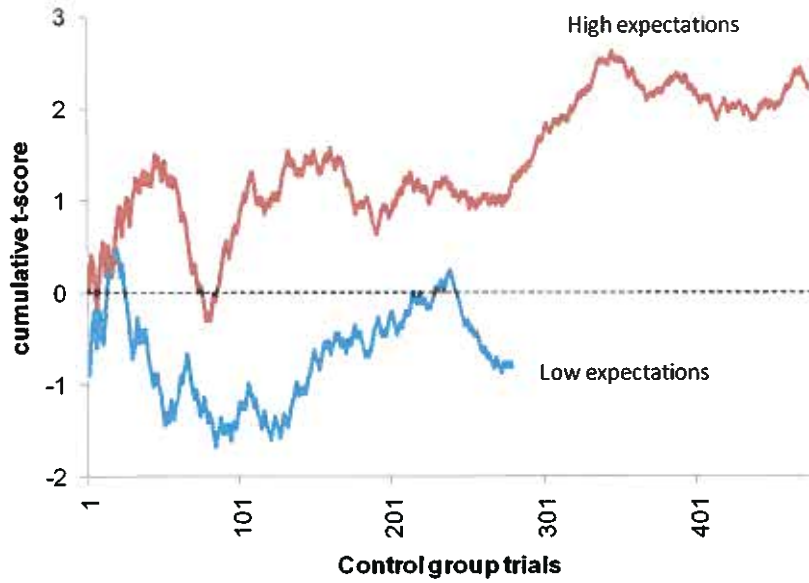


Figure 12. Expectation effect IV. Summed response to all expectation questions for control group members, where high expectations are all trials contributed by those responding with highest and lowest expectations.

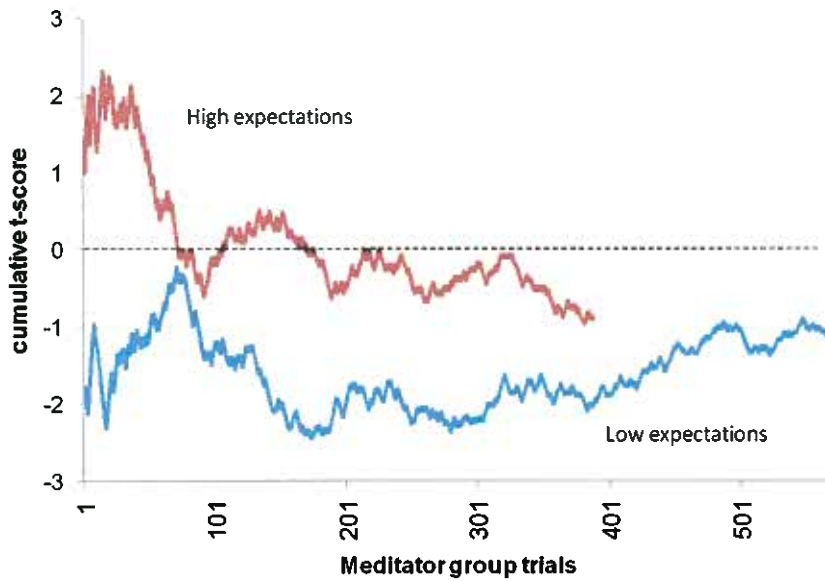


Figure 13. Expectation effect VI. Summed response to all expectation questions for meditation group members.

Discussion

Overall, this study did not support the idea that attention training, in this case the technique known as TM-Sidhi, would improve performance on a “feeling of being stared at” task. Instead, evidence for the opposite was observed – there was a trend toward the control group performing better. The TM group’s self-transcendence scores were significantly higher than the control group’s, which supports one of the goals of that style of meditation. It is perhaps notable that this goal does not include the enhanced ability to detect distant staring, so as mentioned above it may be that one’s ability to consciously perceive distant attention depends on how separate one feels from the environment and from other people. That is, if one regularly experiences a sense of unity with others through long-term daily meditation, then this particular experimental task may be non-optimal because perhaps at some level a TM-Sidhi meditator *always* feels the presence of other minds. Indeed, that group’s uniform “yes” response to the question, are you being stared at, suggests that this is so. By contrast, the control group participants may not regularly sense the nonlocal presence of others, but by directing their attention in this way during the experiment, they discover that they can, to a small degree, detect distant minds directed towards them.

Besides the possible influence of differing goals of attention training, the meditators may have also found the nature of the staring task difficult because it required repeated switching of their attention towards and away from a distant partner, and because the staring task required their eyes to be open. Both of these tasks differ from their usual practice. Evidence that the task may have been perceived as difficult is suggested by the larger number of passed trials in the meditation group, 46 vs. 13 in the control group. In these trials the participants did not respond to the staring task within 20 seconds. In some cases these passes may have occurred because the participants were not adept with a computer mouse, but in others it seems plausible that trying to maintain a meditative state while responding to an externally driven task was challenging.

The most consistent finding in this experiment was the sheep-goat effect – participants’ expectations and beliefs predicted their actual performance. For each of the four expectation questions, participants who expected to do well in this task, as evidenced by their response to the questions, “Do you believe you will do well in this experiment?” and “How would you rate your perceived ability to detect distant staring?”, did in fact do significantly better.

Finally, we have successfully developed an web-based instrument to measure the accuracy of detection of staring from a distance, a potential marker of intuition or psi ability, that may advance the field by overcoming some of the limitations presented by standard methods,

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