

Spring 2018

Meditation May Diminish the Symptoms of Postural Orthostatic Tachycardia Syndrome (POTS)

Allyson Killen

Elizabethtown College, killena@etown.edu

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Recommended Citation

Killen, Allyson, "Meditation May Diminish the Symptoms of Postural Orthostatic Tachycardia Syndrome (POTS)" (2018).
Psychology: Student Scholarship & Creative Works. 2.
<https://jayscholar.etown.edu/psycstu/2>

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Meditation May Diminish The Symptoms of Postural Orthostatic Tachycardia Syndrome (POTS)

Allyson Killen

Elizabethtown College

Introduction

Various forms of meditation have been integrated into treatment options because of the derived benefits. Transcendental Meditation (TM) has been shown to decrease heartrate, blood pressure, and stress symptoms (Seaward, 2018). Additionally, Mindfulness Meditation (MM) has been shown to decrease anxiety and has been used in different treatments for chronic disorders (Buchholz, 2015). To my knowledge, no previous research has looked at the beneficial effects of meditation as a treatment option for POTS. POTS is a dysautonomic disorder characterized by an increase in HR by greater than 30 bpm and an intolerance of orthostatic fluctuations. Since this significantly affects physiological and psychological aspects of functioning and current treatment options are inconsistently effective, this is an important area to investigate. I hypothesized that while both forms will be beneficial, TM will be more beneficial than MM. Additionally, I hypothesized that participants with POTS would have greater overall benefits than healthy control participants.

Method

Study one: Five participants with POTS completed a within subject meditation experiment. During one session they completed a control task and in the second session, a TM task. Both times they answered pretest and posttest questions from COMPASS, Calgary, and overall wellness scales. They also had their BP and HR measured before and after the videos.

Study two: 40 control participants were divided into 3 groups: control condition (n=10), TM condition (n=11), and MM condition (n=12). They each completed one session where they answered pretest and posttest questions from the Calgary, COMPASS, and overall wellness scales. They also had their HR and BP measured before and after the video.

Results

Study one: MANOVA analyses were conducted to determine if there was a significant difference from the control session to the TM session, as well as from the pretest to posttest of each condition. No significance was found, but strong effect sizes indicated measurable differences. The strongest effect size suggested effects between control and TM conditions accounted for 87% of the variance in systolic BP ($F(1,3)= 20.694, p < .020, \eta^2 = .873$). Additionally, there was a moderate effect between the pretest and posttest for the TM group ($F(1,3)= .932, p < .406, \eta^2 = .237$). When examining the heart rate, there was a strong effect size between the TM condition and the control condition ($F(1,4)= 2.791, p < .170, \eta^2 = .411$) and a moderate effect size between the pretest and posttest for TM ($F(1,4)= .002, p < .966, \eta^2 = .10$). For the Calgary scale, there was a moderate effect size of responses for the TM condition compared to the control condition ($F(1,4)= .909, p < .394, \eta^2 = .185$) and a strong effect size for the pretest and posttest of the TM condition ($F(1,4)= 2.243, p < .209, \eta^2 = .359$). For the COMPASS scale, there were no significant effect sizes between the control and TM condition, but there was a moderate difference between the pre- and posttests of the TM condition ($F(1,4)= .044, p < .845, \eta^2 = .195$). (Refer to figures 1-4).

Study two: MANOVA analyses were conducted to determine if there were significant differences between the pre- and post-measures of each condition. Significance was found for the Calgary responses for both TM ($F(1,11)= 6.80, p < .004$) and MM ($F(1,12)= 3.93, p < .001$) conditions. There were no other significant results from any scales in all three conditions. Confidence Intervals were conducted to determine if there was any significant difference in results from study one to study two, but there was no significance found.

Discussion

There were no significant results to indicate TM has a beneficial effect on symptoms of POTS, but the various effect sizes suggest a larger sample size could result in significance. Although the interactions between HR and BP were the opposite of what I hypothesized, all of the other interactions show a trend toward improvement as a result of the meditation. Results from Study two showed both Mindfulness and Transcendental Meditation had a significant impact in reducing perceived stress symptoms, however no significance was found to indicate the effect on HR, BP, and overall feelings of wellness. Although I hypothesized TM to have a more significant impact on participants with POTS, results did not support that hypothesis.

Study One

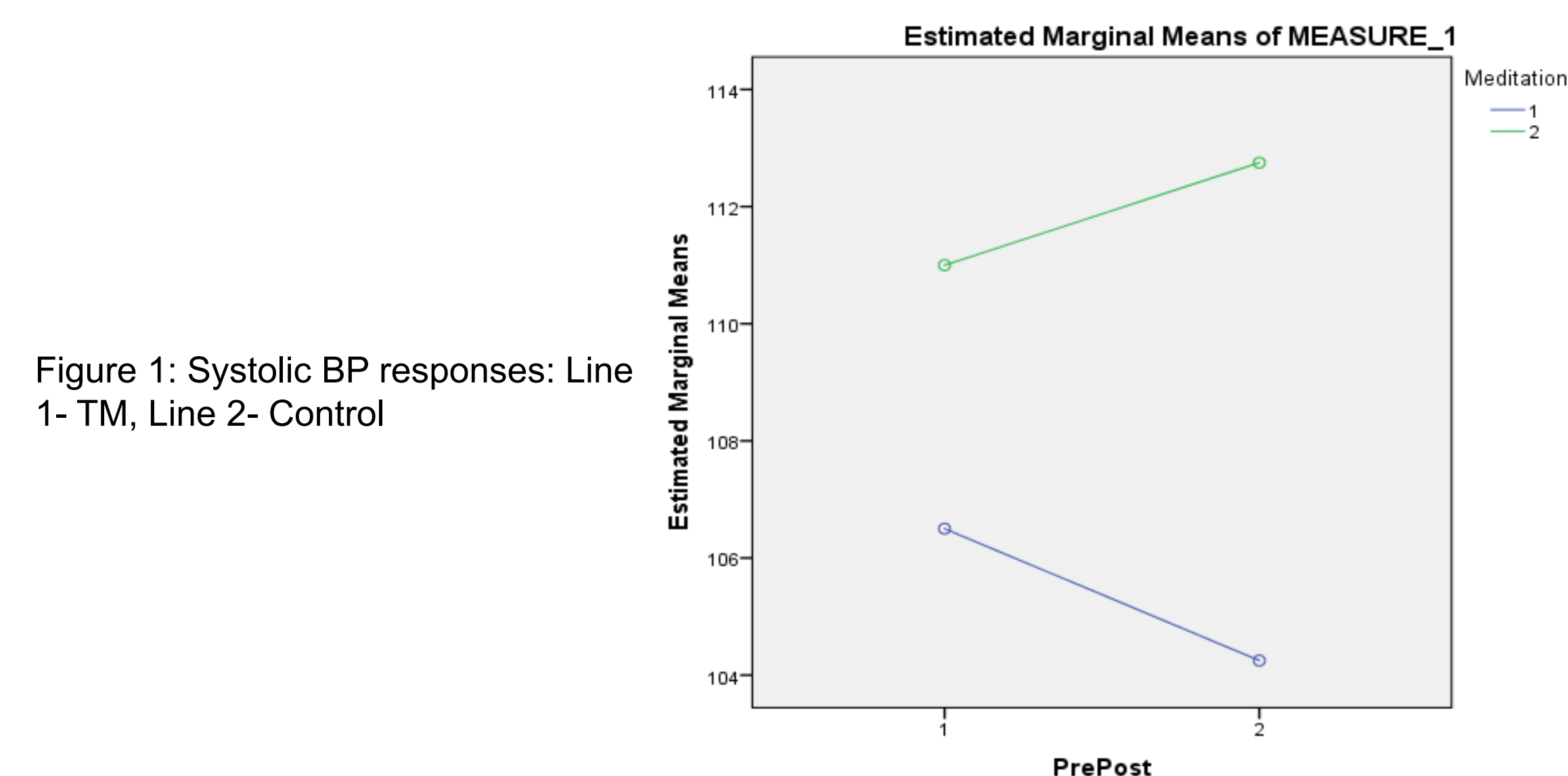


Figure 1: Systolic BP responses: Line 1- TM, Line 2- Control

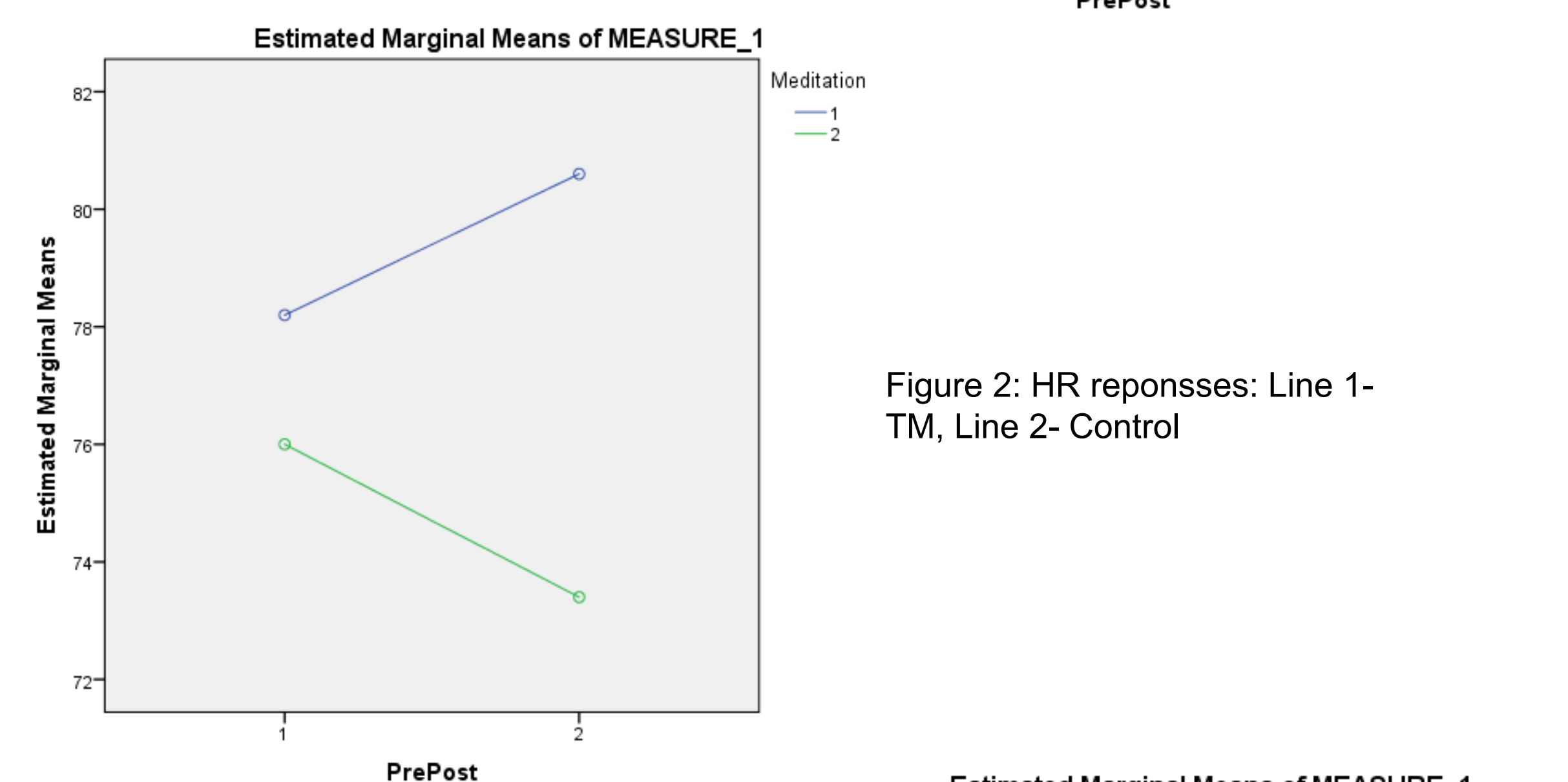


Figure 2: HR responses: Line 1- TM, Line 2- Control

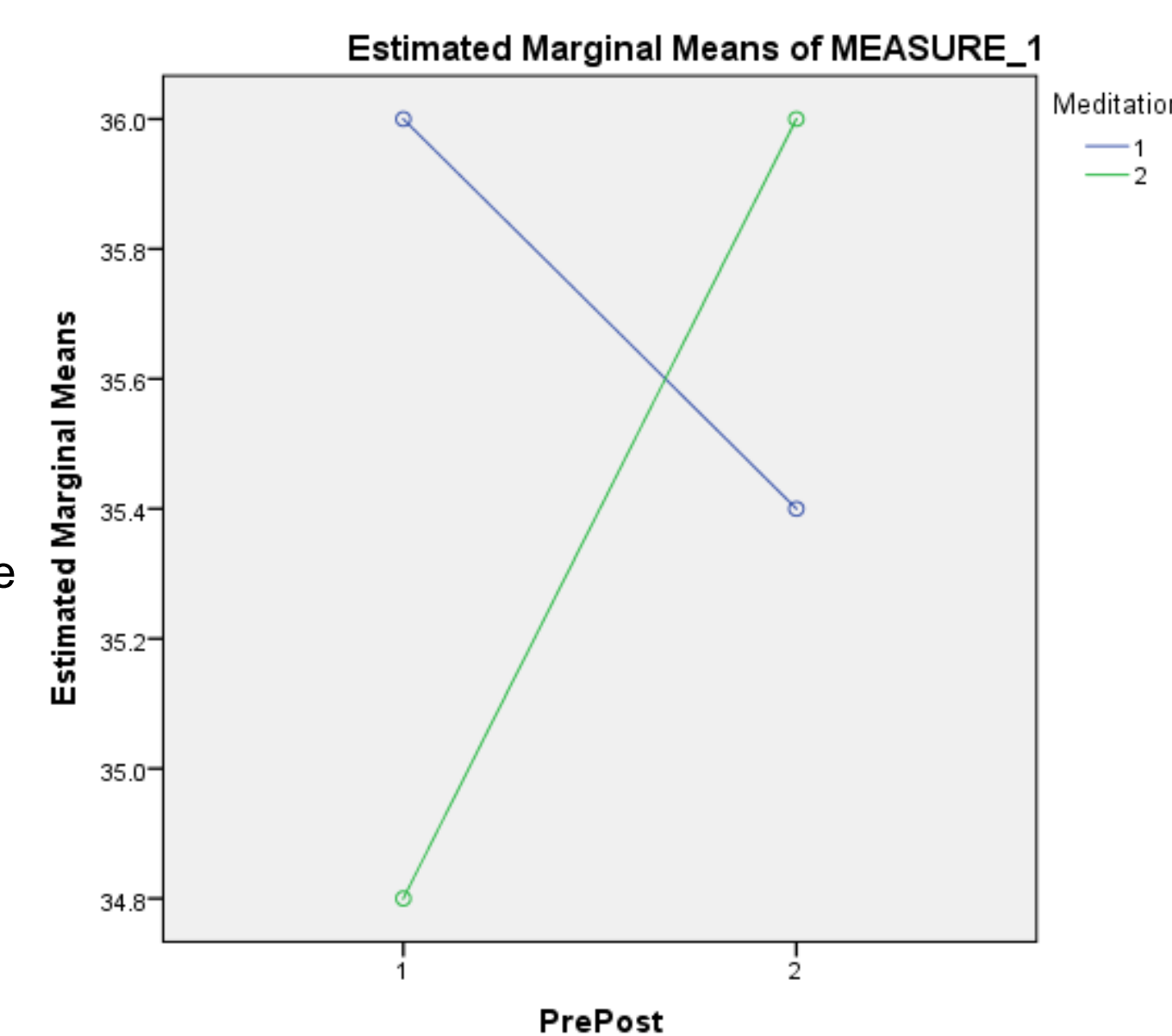


Figure 3: COMPASS responses: Line 1- TM, Line 2- Control

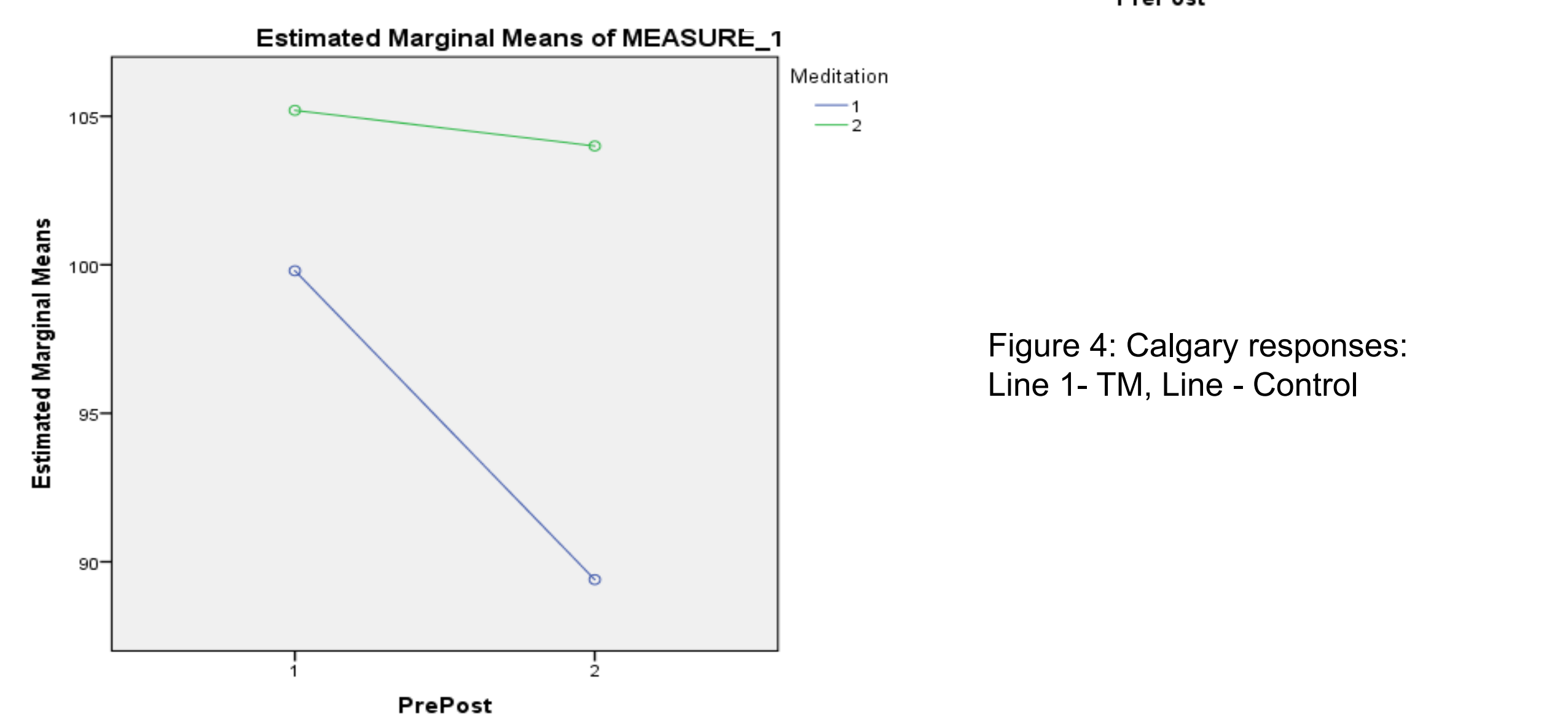


Figure 4: Calgary responses: Line 1- TM, Line - Control