# Impact of Vibrational Frequencies on State Mood and Mindfulness

**Erica Van Steenhuyse**
**Metropolitan State University of Denver**

Mentor:
Dr. Michael Rhoads,
Department of Psychological Sciences, Metropolitan State University of Denver

**Abstract**

Vibration is a part of everyday life, whether we are aware of it or not. Everyone experiences vibration in a variety of different ways: intentionally with music and speech, environmentally by cars, computers, phones, etc., and unconsciously, because there are many vibrational frequencies that are not audible to the human ear. Previous studies have focused on whether vibrational exposure impacts mood or impacts mindfulness, but the aim of the current study was to examine whether exposure to vibration of high and low frequencies has any impact on state mood and mindfulness levels together. Participants ($n$ = 28) were assigned to listen to either high frequencies (20,000Hz and above) or low frequencies (50Hz or below). Regardless of intervention, participants completed the State Mindfulness Survey (SMS) and the Positive and Negative Affect Schedule (PANAS) questionnaires before and after their retrospective intervention. A repeated measures MANOVA was conducted to examine group differences on mood and affect. There was no significant time by condition interactions for any of the dependent variables. There were various limitations in this study that may have led to no significant results, such as insufficient sample size combined with low amplitude levels and short frequency exposure times during intervention.

*Keywords:* environmental sound, mindfulness, mood, sound, vibration

Impact of Vibrational Frequencies on State Mood and Mindfulness

## Introduction

*"Everything owes its existence, solely and completely, to sound."*

*-Hans Jenny*

Sound, and more specifically vibration, is a regular form of physical sensory input. These vibrations are coming from a never-ending list of sources, such as cars, music, verbal interactions, computers, cell phones, air conditioners, wind, etc. People are constantly surrounded by a unique combination of vibrations, and as these vibrations travel through the air people ultimately come into contact with them. This exposure to different vibrational frequencies, even those beyond conscious human perception, may be a form of priming on individual state mindfulness and mood levels (Margolin, Pierce, & Wiley, 2011). Research has recently started to study the impact that some of these vibrational frequencies can have on current mood states. For example, studies have shown that low-pitch background vibration can increase anxiety (Lowe, Katherine, & Aradhna, 2019) and that low-frequency vibration noise pollution from residential trains and construction can increase annoyance (Waddington, Woodcock, Peris, Condie, Sica, Moorhouse, & Steele, 2014). Although the full reasoning behind this is still unknown, this is significant because of the potential for concentrated urban populations that are exposed to more low-frequency background vibrations to have a negative impact on their mood simply due to their environment. Additionally, studies have also shown that Brain Wave Vibration (BWV) training can elevate mood (Bowden, Gaudry, Chan An, & Gruzelier, 2011), and direct high-frequency vibration ultrasound techniques can improve mood temporarily (Hameroff, 2013). This is also significant because it shows a positive correlation between elevated mood levels and exposure to high-frequency vibrations. If this is the case, then having an awareness of the impact that both high and low frequency vibrations can have on an individual could give someone the ability to better control or manipulate their vibrational environment to optimize their mood and mindfulness levels.

**Vibration & Sound Waves**

To further connect how sound waves impact matter, sound wave movement needs to be understood. Sound is vibrational energy that travels through both air and matter (Banas & Zeiler, 1990). Sound travels in the form of waves, usually a combination of sine waves to create a complex wave (Murtiani, Hasanah, Darvina, & Yulkifli, 2019). Vibration comes in many different shapes and sizes depending on amplitude, frequency, and timbre, and may be audible or inaudible. Sound is something that we can audibly sense, as well as tactilely, meaning that not only can we hear vibrations, but we can feel them as well (Levanen & Hamdorf, 2001). Vibrational sound can be transported through a variety of mediums, such as air, gases, liquids, and solids, which gives it extremely unique characteristics and properties (Dunkel, 2018). All vibration has some kind of impact on its atmosphere as it moves through the air and eventually comes into contact with matter. Sound moves in the form of a wave, and can be understood by its wavelength and amplitude. The wavelength of a sound wave refers to the length of one cycle of the wave, and the amplitude refers to the height of each crest of the sound wave (Banas & Zeiler, 1990). The wavelength indicates the number of wave cycles per second and determines the frequency or pitch of that sound wave, which is measured in Hertz (Hz), and the amplitude determines the intensity or loudness of that sound wave, which is known as the decibel (Banas & Zeiler, 1990). Sound is experienced, sensed, and perceived differently based on these sound wave characteristics. Specifically, recent research has inferred that sound vibrations can impact individual’s mood and mindfulness levels.

**Mindfulness**

Mindfulness is a concept that refers to a virtuous state of being that includes having warm, friendly, non-judgmental attitudes that are based off of our perceptions, sensations, and cognitions (Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006), and is the process of being presently attentive to each moment (Schmidt, 2006; Bishop, Lau, Shapiro, Carolson, Anderson, Carmody, Segal, Abbey, Speca, Velting, & Devins, 2004). Mindfulness is a suspension of categorical judgements that humans are generally extremely quick to apply to ourselves, others, or the environment following any perception (Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006). The idea of mindfulness has its roots in Buddhist philosophy and plays a central role in leading humans from individual suffering (Bishop et al., 2004), but it has also been adopted into contemporary psychology and is understood here as a process to increase awareness which enables skillful mental responses to adverse situations.

Mindfulness research began without creating a universal definition of mindfulness, which led to some inconsistent definitions across investigators and studies (Bishop et al., 2004). Bishop et al 2004 comprised a two-part operational definition of mindfulness that helps streamline mindfulness measures, which is used in this study. The first part involves attention regulation on the immediate experience which increases mental recognition of the present, and the second part includes adopting an accepting orientation towards present experiences (Bishop et al., 2004). These two components together require thoughtful observation of individual thoughts and feelings as they change from moment to moment, resulting in an alert and focused attention. Often this state is achieved by self-regulation of breath control and acknowledgement, as well as meditation (Bishop et al., 2004). Research is beginning to speculate whether mindfulness practices can help to elevate individual mood states by controlling emotions with breath and practice, and conversely whether a lack of mindfulness potentially contributes to negative mood states (Elices, Tejedor, Pascual, Carmona, Soriano, & Soler, 2019; Gotnik, Hermans, Heschwind, Nooij, DeGroot & Speckens, 2016). This connection between mindfulness and mood is one that is of new interest to researchers, and of particular interest to this study.

The topic of mindfulness has recently seen a wave of interest in academic research, particularly regarding stress and anxiety studies. More than 80 percent of scientific research on meditation that was federally funded in 2007 and 2008 was based on mindfulness, and interest has continued to grow (Margolin, Pierce, & Wiley, 2011). This study is focusing on the potential connection between mood and mindfulness and the possible positive correlation that may exist between the two states, particularly in relation to high and/or low vibrational frequency exposure. If someone has an elevated mindfulness state, which means they are more present and aware of their surroundings, it can lead to an increased mood from the lack of worry and anxiety due to the increased mindfulness (Hameroff, 2013). Additionally, the opposite is possible: the less mindful/present/aware someone is, it may be possible to become more agitated or anxious. This intersection between frequency exposure, mindfulness, and mood is the area this project targeted to explore.

**Mood**

Current mood states can be understood as diffuse affective states that impact any current experiences, thoughts, and behaviors. Moods can be unconscious initially until they are consciously experienced, at which time this mood generally takes on the persons full attention and predominates that person’s subjective feelings (Wilhelm & Schoebi, 2007). Recent research on awareness and depression suggests that there is a connection between mood and mindfulness (Elices, Tejedor, Pascual, Carmona, Soriano, & Soler, 2019; Gotnik, Hermans, Heschwind, Nooij, DeGroot & Speckens, 2016). This research correlates with Mindfulness Based Cognitive Therapy (MBCT) tactics, which suggests that modifications to mood state can diminish a person's ability to be present, implying that mindfulness may be mood dependent (Elices et al., 2019). This is another connection this project focused on to further explore. Moreover, Gotnik et al 2016 showed a specific positive correlation between mood and mindfulness with data indicating that increased state mindfulness and positive affect enhance one another, while alternatively increased state mindfulness predicted less negative affect, with positive affect referring to the ability to experience positive emotions and experiences and negative affect referring to the inability to experience positive emotions and/or a negative relationship with the environment or surroundings.

**The Current Study**

This study aims to investigate whether participant exposure to frequencies above 20,000 Hz and below 100 Hz impacts current state mindfulness and mood levels. These two frequency thresholds have been chosen for this experiment for several reasons: 1. It shows a large dichotomic difference between high-frequency and low-frequency vibrations, 2. Frequencies in the range of 60-100 Hz may contribute negatively to physiological and psychological states, such as increased anxiety or worry (Schust, 2004), and 3. Ultrasound waves, which begin around 20,000 Hz, may improve current mood states by calming the nervous system (Hameroff, 2013). In this study, these states will be measures by the SMS and the PANAS measures.

# Method

## Measures

**Demographic Questionnaire.** With a brief questionnaire, I assessed participants' demographic characteristics, including age, gender identity, ethnicity, racial background, and grade level.

**State Mindfulness Scale.** The State Mindfulness Scale (SMS) was designed to measure and quantify subjective awareness levels of present attention within two domains: body and mind. This questionnaire was developed with traditional Buddhist and contemporary psychology mindfulness definitions to create a means of current mindfulness measurements (Galia & Amit, 2019). All scores for body subscale questions were totaled, and all scores for mind subscale questions were totaled, with higher scores equating to higher levels of state mindfulness in those subscale areas. The survey consists of twenty-one items that are answered on a 5-point Likert scale based on the extent the participant feels that way at that exact moment, ranging from 1 (*being 'not at all'*) and 5 (*being 'well'*) (Tanay & Bernstein, 2013). The SMS demonstrated excellent internal consistency in a previous sample, (SMS mind subscale $\alpha = .91$, and body subscale $\alpha = .85$; Tanay & Bernstein, 2013). This measure also produced a strong test-retest reliability (Tanay & Bernstein, 2013). The SMS has also shown good criterion, structural, convergent, and incremental validity (Tanay & Bernstein, 2013).

**Positive and Negative Affect Scale.** The Positive and Negative Affect Scale (PANAS) is designed to measure mood regarding positive affect and negative affect for either the present moment or the past week. For the purpose of this study, participants will be asked to complete the survey based on present moment. The survey consists of 20 questions that are to be answered on a 5-point Likert scale based on the extent the participant feels at that exact moment, ranging from 1 (*being 'very slightly or not at all'*) to 5 (*being 'extremely'*). This measure has two subscales: positive affect (PA) and negative affect (NA). Items on the positive affect subscale are summed, as well as for the negative affect subscale. Higher scores represent higher levels of negative or positive affect. This measure demonstrated strong internal consistency (PA subscale for present moment, $\alpha = .89$ and NA sub-scale for present moment, $\alpha = .85$; Watson & Clark, 1988). The PANAS showed good convergent, discriminant, and external validity in a previous sample (Watson & Clark, 1988).

**Procedure**

This study received approval from the local Institutional Review Board (IRB). Participants were pooled from Introduction to Psychology in-person classes from a public, urban university at the same institution, and provided students with a mandatory lab credit upon successful completion of their participation in this lab study. All students had the opportunity to view different studies and voluntarily choose this study over other options. Participants (n = 28) was the final number of participants for this study given all participant cancellations and winter weather issues. Participants had a mean age of 21.36 (SD = 3.62). For gender, 17.9% of participants identified as male, 78.6% identified as female, and 3.6% identified as genderqueer. For ethnicity, 10.7% were African-American/Black, 10.7% were Asian/Pacific Islanders, 32.1% were Caucasian, 42.9% were Latino, and 3.6% were other. For college level, 42.9% were freshman, 28.6% were sophomore, 21.4% were junior, and 3.6% were a senior. All participants provided informed consent prior to participation. Initially, each session was randomly assigned to one of two experimental conditions using a random number generator: high frequency tones or low frequency tones (a control was not used due to time limitations of each lab session with participants; this is an initial design flaw that was attempted to be addressed in the follow-up study that was indefinitely interrupted due to COVID, see discussion section). However, due to participant sign up irregularities as well as winter weather cancellations, halfway through the study there were far more participants in the low frequency group than the high frequency group, so that was manually adjusted to even out the participant groupings for data analysis purposes. Regardless of the condition assigned, all participants filled out the same pre-intervention measures (demographic, SMS, and PANAS). Once completed, participants were instructed to stop, as indicated on their measures packet, and sit quietly until further instruction. Once all participants had completed the initial set of measures, three different tones are then played for the participants. These tones were played via the researcher's cell phone using the Sonic Hz app. This app allows you to input any frequency between 0-25,000 Hz and play them instantly. If the session was randomly assigned to the low frequency tones, then the researcher played the following tones for 30 seconds each: 100 Hz, 50 Hz, and 5 Hz. If the session was randomly assigned to the high frequency tones, then the researcher played the following tones for 30 seconds each: 20,000 Hz, 22,500 Hz, and 25,000 Hz. The 30-second tone exposure term was chosen due to time limitations of the experiment. (In the attempted follow-up study, which was again interrupted due to COVID, the time was extended to 3 minutes per tone to provide a more substantial exposure time). After the applicable tones have been played, participants completed the SMS and the PANAS scale post-intervention surveys a second time to see if the exposure to high or low frequency sound had any impact on their state mood and mindfulness levels. Once complete, participants received course credit for their participation in this study.

# Results

## Preliminary Examination

During preliminary examination, no outliers or univariate outliers were found in the data set. It is important to indicate any potential outliers, as an outlier can either signal something of scientific interest to the study, or it can reveal bad data or an experimental flaw (Gress, Denvir, & Shapiro, 2018).

## Differences Between Conditions

To test whether exposure to high frequencies or low frequencies had any impact on state mood and/or mindfulness levels, a one-way repeated measures MANOVA was conducted to examine whether there were significant differences between conditions in positive affect, negative affect, and mindfulness (body and mind) across time. A MANOVA was used as opposed to other statistical tools because it specifically determines differences between multiple dependent variables between treatment or intervention with two or more dependent variables (responses) based on a single independent variable (factor) (Holmes, 2016). The independent variable is the vibrational frequency exposure (Hz, high or low), and the dependent variables are mood (via the PANAS measure) and mindfulness (via the SMS measure), with the dependent variables being measured both pre- and post-intervention. There was not a significant interaction between time and condition on the dependent variables, indicating that the frequency exposure had no effect on participants' state mood, or their state mindfulness levels in this study. In other words, positive effect, negative effect, and mindfulness measures were not significantly different before and after exposure to high or low frequency sounds. Since the main effect was insignificant, no further statistical analysis was done for this pilot study $F(4,18) = 0.14$, $p = .97$, partial $\eta^2 = .03$. Using the Wilks' Lambda criterion, the combined dependent variables also did not show a significant time effect, $F(4,18) = 0.89$, $p < .50$, partial $\eta^2 = .16$. See Table 1 for descriptive statistics for the main variables by condition and for the total sample.

## Discussion

The present study examined whether exposure to different kinds of high or low frequencies impact state mood and mindfulness levels. The results showed no statistically significant interaction between high or low frequency exposure and current mood and/or mindfulness levels. However, this insignificance could have been because of differences in this study versus previous studies. To compare this present study to other previous studies, the sample size was small, participant exposure to the independent variable (high or low frequency tones) was for an insufficient duration, and an unnecessary confounding variable was included due to several other unrelated studies being conducted in the same lab session. For example, in Gotnik et al 2016, they had participants practice mindfulness by walking in nature; despite his study also having a small sample size of only 29 participants, it had a much longer intervention period of up to 10 days with mindfulness and mood check-ins throughout the day on their cell phone. His intervention period is much longer and more detailed than this present study, which had only 30-second frequency exposure and no mindfulness preparation or follow-up. Elices et al 2019 conducted a survey experiment by having clinical and non-clinical patients complete questionnaires based on present awareness, present acceptance, and depressive symptoms, with the results showing a positive correlation between depressive states and low levels of present awareness. Elices's study had a much larger sample size of 246 participants and, despite the short one-time survey intervention period, they were able to hone their study specifically to their hypothesis, allowing them to more concretely confirm any results to be a direct result of the study's intervention. This is a significant difference because, for the present study, several other survey questionnaires were administered for other unrelated projects that contained sensitive questions, which could have negatively impacted participant mood despite any intervention efforts (Labott, Johnson, Fendrich & Feeny, 2013). Lowe, Katherine, & Aradhna 2019 were able to research vibrational frequencies in their complex timbre and background noise state as a mood prime as opposed to focusing on high and low frequency pure tones in a quiet lab environment like the present study did. Waddington, Woodcock, and Peris 2014 conducted a study with 24-hour intervention periods where participants were exposed to environmental low-frequencies with sound sources such as construction work to see if the exposure had any impact on mood. They were able to show a positive correlation between mood and vibrational frequency exposure with a large sample size of over 1000 participants, while the present study did not meet these standards for number of participants or frequency exposure time. This present study was not a replication of any of these previous studies, as most of these studies focus on either vibration and mood or vibration and mindfulness, but none researched the interaction between vibration and mood and mindfulness together. Therefore, in order explore something in a new way, this present study was pulling ideas from many of these previous studies in order to test something that has not been tested or researched all together at once. *If significant findings in follow-up studies were to be found, they would support the idea that individual knowledge and awareness of these vibrational impacts would allow more individual control over their environment to intentionally optimize their mood and mindfulness levels.*

There were several limitations in this current study that may have contributed to this statistically insignificant finding. The main limit was insufficient sample size in the current experiment. Since this study was dependent on voluntary student participation from Psychology 101 courses and there were an abnormally large number of available studies for students to choose from, the participant count did not reach a sufficient number in the pilot study. Another influential limitation is that the amplitude given off from a cell phone is relatively small, so the frequency exposure the participants were exposed to may have been too small to have any significant impact (Gotnik et al., 2016). Also, since several studies were combined into one IRB and therefore measures were combined from several studies for participants to complete at one time that contained sensitive questions, this could have had a negative impact on mood and mindfulness despite any intervention efforts (Labott, Johnson, Fendrich & Feeny, 2013). There were several studies combined into one session due to the nature and set up of how students signed up for participation. For example, in the session where my experiment was conducted, there were also three other unrelated studies being conducted that required participants to fill out other measure's sheets, although this vibration study was the only experiment conducted per session. This also was a large factor in time and tone exposure in the pilot study. Due to these limitations, it may be premature to draw any final conclusions about the impact of frequency exposure on state mood and mindfulness. A follow up study was started in the Spring of 2020 to address these limitations, such as securing a larger sample size, using a stereo or device with a much larger amplitude capability than a cell phone for playing the different frequencies, and only including the measures for this study in the measures packet for participants to complete. The follow-up experiment was being conducted as a stand-alone study to avoid potential interference, utilized a large JBL speaker to increase the amplitude of each tone, increased the tone exposure time to 3 minutes, included a control group where participants were not exposed to any high or low frequency tones and were simply exposed to environmental sound instead, and recruited three undergraduate assistants to help in running additional sessions to increase participant count. Unfortunately, the COVID pandemic hit in March of 2020 when this follow-up study finally begun, which has put the study on an indefinite pause. Despite the COVID interruption and the initial insignificant statistical result, further study is warranted to explore the connection between vibrational frequency, mood, and mindfulness in order to allow individuals to best control their environments to behave at an optimal level and selectively reduce vibrational frequencies that may be hindering their state emotions.

**References**

Banas, S., & Zeiler, B. (1990). The science of sound: Buzz, crackle, bang--sound is everywhere! Use these fun activities to help students discover how sound travels and how our ears pick it up. *Instructor, 114*(2). 51-65.

Bishop, S., Lau, M., Shapiro, S., Carlson, L., Anderson, N., Carmody, J., Segal, Z., Abbey, S., Speca, M., Velting, D., Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11*(3) 230-241. https://doi.org:10.1093/clipsy/bph07

Bowden, D., Gaudry, C., Chan An, S., & Gruzelier, J. (2011). A comparative randomized controlled trial of the effects of brain wave vibration training, Iyengar yoga, and mindfulness on mood, well-being, and salivary cortisol. *Evidence-Based Complementary and Alternative Medicine, 2012*, 1-13. doi:10.1155/2012/234713

Dunkel, J. (2018). Rolling sound waves. *Nature Materials, 17,* 759-760. https://doi-org.aurarialibrary.idm.oclc.org/10.1038/s41563-018-0155-9

Elices, M., Rejedor, R., Pascual, J., Carmona, C., Soriano, J., Soler, J. (2019). Acceptance and present-moment awareness in psychiatric disorders: is mindfulness mood dependent?. *Psychiatry Research, 273*. 363-368. https://doi.org/10.1016/j.psychres.2019.01.041

Galia, T., & Amit, B. (2019). State Mindfulness Scale (SMS): Development and initial validation. Psychological Assessment: *A Journal of Consulting and Clinical Psychology,. 25*(4), 1286-1299. http://dx.doi.org.proxy.ccis.edu/10.1037/a0034044

Gotnik, R., Hermans, K., Geschwind, N., Nooji, R., Groot, W., & Speckens, A. (2016). Mindfulness and mood stimulate each other in an upward spiral: A mindful walking intervention using experience sampling. *Mindfulness, 7(*5). 1114-1122. doi: 10.1007/s12671-016-0550-8

Gress, T., Denvir, J., Shapiro. (2018). Effect of removing outliers on statistical inference: Implications to interpretation of experimental data in medical research. *Marshall Journal of Medicine, 4*(2), doi: 10.18590/mjm.2018.vol4.iss2.9

Hameroff, S. (2013). Good vibrations: Mediating mood through brain ultrasound. *States News Service, Gale Academic*, 1-2.

Holmes, F. (2016). Missing data and multiple imputation in the context of multivariate analysis of variance. *Journal of Experimental Education, 8*4(2), 356-372. doi: 10.1080/00220973.2015.1011594

Labott, S., Johnson, T., Fendrich, M., & Feeny, N. (2013). Emotional risks to respondents in survey research: some empirical evidence. *HHS, 8*(4), 53-66. doi: 10.1525/jer.2013.8.4.53

Levanen, S., & Hamdorf, D. (2001). Feeling vibrations: enhanced tactile sensitivity in congenitally deaf humans. *Neuroscience Letters, 301*(1), 75-77. https://doi.org/10.1016/S0304-3940(01)01597-X

Lowe, M., Katherine, L., & Aradhna, K. (2019). A quiet disquiet: Anxiety and risk avoidance due to nonconscious auditory priming. *Journal of Consumer Research, 46*(1). 159-179. DOI: 10.1093/jcr/ucy068

Margolin, I., Pierce, J., & Wiley, A. (2011). Wellness through a creative lens: Meditation and visualization. *Journal of Religion & Spirituality in Social Work, 30*, 234-25. https://doi.org/10.1080/15426432.2011.587385

Murtiani, Hasanah, H., Darvina, Y., & Yulkifli, (2019). Development of interactive teaching materials with scientific approach contains character values in learning matter about sounds waves, light wave, and optical devices in senior high school class XI. *Journal of Physics: Conference Series, 1317*(1). doi:10.1088/1742-6596/1317/1/012164

Schust, M. (2004). Effects of low frequency noise up to 100 hz. *Noise Health, 6*(23), 73-85.

Tanay, G., & Bernstein, A. (2013). State Mindfulness Scale (SMS): Development and initial validation. *Psychological Assessment, 25*(4), 1286-1299. http://dx.doi.org/10.1037/a0034044

Waddington, D., Woodcock, J., & Peris, E. (2014). Human response to vibration in residential environments. *The Journal of the Acoustical Society of America, 135*(182). https://doi.org/10.1121/1.4836496

Walach, H., Buchheld, N., Buttenmuller, W., Kleinknecht, N., & Schmidt, S. (2006). Measuring mindfulness – The Freiburg Mindfulness Inventory (FMI). *Personality and Individual Differences, 40*(8), 1543-1555. https://doi.org/10.1016/j.paid.2005.11.025

Watson, D. & Clark, L. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology. 54*(6). 1063-1070. DOI:10.1037/0022-3514.54.6.1063

Wilhelm, P., & Schoebi, D. (2007). Assessing mood in daily life: Structural validity, sensitivity to change, and reliability of a short-scale to measure three basic dimensions of mood. *Journal of Psychological Assessment, 23*(4). DOI:10.1027/1015-5759.23.4.258

Table 1

*Descriptive Statistics*

| PA-PANAS1 | *M* | (*SD*) |
|---|---|---|
| High Group | 30.30 | 9.77 |
| Low Group | 27.38 | 7.83 |
| Total | 28.65 | 8.64 |
| **PA-PANAS2** | *M* | (*SD*) |
| High Group | 29.20 | 9.30 |
| Low Group | 27.23 | 9.91 |
| Total | 28.09 | 9.48 |
| **NA-PANAS1** | *M* | (*SD*) |
| High Group | 16.00 | 6.94 |
| Low Group | 16.08 | 4.77 |
| Total | 16.04 | 5.67 |
| **NA-PANAS2** | *M* | (*SD*) |
| High Group | 16.30 | 5.72 |
| Low Group | 15.62 | 5.68 |
| Total | 15.91 | 5.58 |
| **BODY-SMS1** | *M* | (*SD*) |
| High Group | 22.10 | 5.98 |
| Low Group | 21.85 | 6.03 |
| Total | 21.96 | 5.87 |

| BODY-SMS2 | *M* | (*SD*) |
|---|---|---|
| High Group | 21.20 | 4.66 |
| Low Group | 19.85 | 5.13 |
| Total | 20.43 | 4.87 |
| **MIND-SMS1** | *M* | (*SD*) |
| High Group | 55.60 | 15.66 |
| Low Group | 56.00 | 12.85 |
| Total | 55.83 | 13.80 |
| **MIND-SMS2** | *M* | (*SD*) |
| High Group | 56.60 | 9.22 |
| Low Group | 56.23 | 14.39 |
| Total | 56.39 | 12.15 |

*Note*. PA-PANAS1 = Positive affect subscale for the Positive and Negative Affect Schedule pre-test, PA-PANAS2 = Positive affect subscale for the Positive and Negative Affect Schedule post-test, NA-PANAS1 = Negative affect subscale for the Positive and Negative Affect Schedule pre-test, NA-PANAS2 = Negative affect subscale for the Positive and Negative Affect Schedule post-test, BODY-SMS1 = Body subscale for the State Mindfulness Survey pre-test, BODY-SMS2 = Body subscale for the State Mindfulness Survey post-test, MIND-SMS1 = Mind subscale for the State Mindfulness Survey pre-test, and MIND-SMS2 = Mind subscale for the State Mindfulness Survey post-test.