

6-2016

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McKenzie, Brittany (2016) "Effects of Music on Stress and Mindfulness," *Psychology Research Methods Journal*: Vol. 1 : Iss. 19 , Article 5.

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Effects of Music on Stress and Mindfulness

Brittany McKenzie⁴

The possible differential effects that Zen and electronic dance music (EDM) have on stress and mindfulness were analyzed. The purpose of this study is to understand if certain factors of music are more influential on stress levels and mindfulness scores. Factors of music that were analyzed include different genres and the tempo or pace of these music genres. Fifty-six adult participants ages 17-79 completed an online survey. The online survey had participants complete a mental rotation task then rate their perceived state stress levels and mindfulness scores for baseline measures. Participants listened to either a 3 min. audio file of a Zen or EDM song. Lastly, participants were asked again to rate the extent of their agreement or disagreement on statements regarding state levels and mindfulness scores. The results did not reveal any significant differences in stress levels and mindfulness scores between participants in the Zen and EDM condition. However, there was a significant decrease in stress levels for participants whom listened to EDM. Additionally, there was a significant increase in mindfulness scores for participants who listened to Zen music.

Music is an immense part of several people's lives in today's age. Music can be heard playing almost anywhere including malls, restaurants, cars, gyms, and etc. Several genres of music can be readily available through the internet, radio systems, TVs, cell phones, tablets, and Mp3 players. Music in general has the capability to affect a listener's physical and mental state in a variety of ways. However, different types of music or genres seem to have differential effects on listeners. For example, previous research has found that listening to classical music for just 20 min reduced heart rate, skin conductance, and respiration (Labbe, Schmidt, Babin, &

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Pharr, 2007). Smith and Joyce (2004) conducted a study to analyze the effects of listening to Mozart and New Age Music on relaxation and symptoms of stress. Participants who listened to Mozart once a day for three days felt more relaxed (mentally more at peace) and gracious. On the other hand, Jiang, Zhou, Rickson, and Jiang (2013) found that preferred “stimulative” and sedative music equally reduced anxiety and tension scores within participants (without any additional activity); sedative music has a slower tempo and less pitch changes. Aside from examining tempo, Nakajima, Tanaka, Mima, and Izumi (2016) have found that listening to a higher frequency version of a Mozart composition resulted in lower stress scores.

In addition to reducing stress and anxiety, listening to a specific type of calming music has increased measures of mindfulness and spatial reasoning. Bell, McIntyre, and Hadley (2016) found that listening to classical music for up to 6 or 12 weeks daily resulted in a positive correlation between spatial reasoning and mindfulness. This means that these two individual scores increased throughout the 12 weeks after listening to classical music. Listening to a faster paced classical composition by Mozart compared to a slower composition by Albinoni yielded a happier shift in mood and arousal by participants; several other studies suggest that a shift or increase in arousal and mood resulted in improved or better scores on cognitive tasks rather than the music itself (Schellenberg, 2005). Since many studies select songs for participants to listen to, Perham and Withey (2012) analyzed the effect of song preference on spatial rotation abilities. These researchers’ found that listening to faster-tempo song yielded significantly more accurate

answers to a spatial rotation task, regardless of preference (Perham & Withey, 2012). Therefore these studies are suggesting that regardless of preference, a faster paced song (which could possibly be a classical composition) positively influences mindfulness in general.

Living in the very busy world today, it is important to examine how one can possibly build attentiveness to personal thoughts, emotions, and to surroundings. Being mindful includes, “being attentive to and aware of what is taking place in the present moment” (Bell, McIntyre, & Hadley, 2016, p.227). Another outlet for music can be to bring about an overall awareness to thoughts and feelings. Specific genres such as Zen or meditation music are specifically paired with calming activities such as yoga to induce a relaxing yet mindfully awakening effect.

It is additionally important for individuals to know which genre elicits a calming effect for themselves, personally because stress is a daily occurrence for most people. Previous studies that have tested the effects of music have predominantly used classical music, however, not everyone may not enjoy listening to classical music. To account for this, the present study examined music genres other than classical music to see if these genres were significantly effective in reducing stress. Two different genres were used within this study in order to compare the differential effects. The principal investigator hypothesized that stress scores would be significantly lower and mindfulness scores would be significantly higher after listening to Zen music compared to Electronic Dance music. The purpose of this study is to better understand if

effects on stress and mindfulness are influenced more so by listening to certain genres of music, tempo or pitch of music, or music in general.

Method

Participants

Fifty-six adult participants between the ages of 17 through 79 (with a mean age of 25.4 years) completed the study. There were 2 participants whom identified themselves as American Indian or Alaskan Native (3.57%), 4 as African American or Black (7.14), 15 as either Hispanic, Latino or of Spanish origin (26.79), 1 as Middle Eastern or North African (1.79%), 2 as Pacific Islanders (3.57%), and 40 as Caucasian or White (71.43%) through self-report. Additionally 22 participants identified themselves as male, 32 as female, 1 as intersex, and 1 preferred not to answer.

Participants attending Lindenwood University were recruited through Sona Systems online. The principal investigator additionally recruited participants through social media, including Facebook. Participants only received extra credit for select courses through the Lindenwood Participant Pool (LPP) at Lindenwood University, as compensation. The present study was available to potential participants on March 28th through April 14th on Sona Systems. Participants still have access to the present study on Facebook. A total of 27 participants listened to Zen music while 25 participants listened to EDM.

Materials

An online survey was administered to participants in order to measure perceived stress levels and mindfulness scores. Music was used in this study to examine the relationships between music and reduced stress, as well as music and increased mindfulness. The survey included two different songs. Both genres were chosen for this study to determine if one type of genre can induce more relaxing or mindful effects more significantly than the other. Two different songs were presented as audio files instead of videos in order to eliminate possible confounding variables (such as distractions from the visual video and to increase consistency).

Zen music was chosen instead of classical music because the intention was to induce relaxation, which Zen has mostly been used for this purpose. Zen music or meditation music is a subgenre of new age music, which is mostly instrumental. Zen music played for every other participant while EDM played for the participants in between. EDM was chosen for this study because it is a subgenre of electronic music and therefore is upbeat (the opposite of a relaxing tune). Both songs were both roughly 3 min long and are instrumental songs. The length of each song needed to be long enough in order to have an effect but not too long where participants would become bored or distracted. Participants only listened to one of the songs in order to eliminate fatigue or order effects. Nearly half of the participants listened to a Zen song, *Is Not All One* by Scott (1965) while the other half of participants listened to an EDM song, *The Only Way is Up* by Martin Garrix and Tiesto (2015). The informed consent form requested participants to have headphones or speakers in order to participate within this study.

If music is going to have any calming or relaxing effects, participants must feel at least some level of stress prior to listening to whichever song is assigned to them. To induce stress, a cognitive task was implemented and participants were asked to complete this before continuing with the study. The cognitive task included seven different questions, adopted from Karanovsky (n.d), which had participants match rotated shapes with their correct original shape by visually or mentally rotating them. Participants had 4 min to complete seven different mental rotation tasks. Results of the mental rotation task was not scored or presented to the participants. Next, the participants were asked to rate the extent of their agreement or disagreement on statements regarding state levels and mindfulness scores.

Items regarding stress were adopted from Levenstein et al. (1993). The stress items (numbered 14 and 23) were modified to “I” statements rather than “you” statements in order to be parallel with mindfulness items. For example, one item was changed from “you feel calm” to “I feel calm.” A total of 10 questions were adopted from Levenstein et al. (1993) rather than the full set in order to make sure that the survey would not be too long or tiring for participants. Eight items regarding mindfulness were also adopted from Tanay and Bernstein (2013). Mindfulness items (numbered 15 and 24) were switched to present tense format instead of past tense in order to match tense of stress items. A Likert scale rated state stress and mindfulness items. Half of the items regarding stress levels and mindfulness scores were placed before the

audio while another set of items regarding stress and mindfulness scores were placed after the audio to reduce repetition.

Items numbered 18 through 22 were filler items and were not included in the final calculations; these questions relate to music and stress. The survey included filler questions in order to make a swift and logical transition from listening to music to answering questions regarding stress and mindfulness again. These questions were asked to additionally understand if participants' thoughts on music. Lastly, demographic questions such as age, gender, and origin/race or ethnicity were asked in order to describe the sample. The totality of this survey was created on Qualtrics. Qualtrics is an online source that has the tools to create, distribute, and analyze the results of a survey. Qualtrics provided an anonymous link to distribute the survey.

Procedure

First, participants began the survey by clicking on the link of the anonymous survey. Participants first voluntarily gave consent to take part in this study after briefly reading what the study is about (see Appendix A). They were then prompted to either choose to participate or choose not to participate (see Appendix B). Consent to participate in the study suggested that the participant had access to speakers or headphones, voluntarily participated, and understood that there were minimal risks. Participants were then asked their age in years (see Appendix B); the survey would not allow participants under the age of 18 to continue unless they had a parental consent form filed with the LPP. On a typical computer screen, participants had to click on two

forward arrows in the bottom right corner of the screen to access the next page of the survey. A timer appeared starting at four minutes on the next page; participants had four minutes to complete seven different cognitive tasks including items numbered 7 through 13 (see Appendix B). Only seven out of 13 questions were adopted from Karanovsky (n.d.) (see Appendix C).

A set of 5 statements under item number 14 appeared next regarding perceived state stress levels (see Appendix B). In the following order, items numbered 3, 6, 30, 26, and 14 were presented from Appendix D. The survey prompted participants to indicate the extent of their personal agreement or disagreement. Participants could then choose either strongly disagree, somewhat agree, neither agree nor disagree, somewhat disagree, or strongly disagree for each item. Next, they were prompted again to indicate the extent of their agreement or disagreement on four statements regarding their current state of awareness of mindfulness scores (see Appendix B). In the following order, items numbered 13, 14, 18, and 12 were presented from Appendix E.

Next, the survey prompted participants to fully listen to whichever audio file they were given to (see Appendix B). After listening to either the Zen audio file for 3 min and 16 s or the EDM audio file for 3min and 9s, participants were prompted to answer questions numbered 18 through 24. Survey items 18 through 22 in the correct following order appeared (see Appendix B).

Next item number 23 prompted participants to indicate the extent of their agreement or disagreement on five different statements regarding perceived state stress levels (see Appendix B) again. In the following order, items numbered 10, 18, 20, 27, and 12 were presented from Appendix D. Item number 24 prompted participants again to indicate the extent of their agreement or disagreement on four different statements regarding their current state of awareness of mindfulness scores (see Appendix B). In the following order, items numbered 19, 3, 15, and 20 were presented from Appendix E.

On the following page of the survey, question number 25 and 26 appeared. Item number 25 asked participants to choose the category of ethnicity that best described them (see Appendix B). Item number 26 prompted participants to choose the category presented that best described their gender identity (see Appendix B). Participants next read a debriefing statement including an explanation of the mental rotation task, the audio files, and the proposed hypothesis. Possible benefits and contact information were listed as well (see Appendix F). Lastly, a quick thank you from Qualtrics appeared on the next page and participants were lastly free to exit the anonymous online survey.

For calculation purposes, individual answer options for each item regarding stress and mindfulness were coded with different values (questions numbered 14, 15, 23, and 24). The difference between pre-stress and post-stress levels was calculated for each participant within the Zen condition. Additionally, the difference between pre and post stress levels was calculated for

each participant within the mindfulness condition. Next, two separate independent t-tests were conducted to compare the total differences between the Zen condition and the EDM condition.

Results

The analysis revealed that the mean difference score for stress levels for participants who listened to Zen music was .32 (SD=3.68) and the score for those who listened to EDM was -.85 (SD=4.40), which are not statistically different from each other, $t(52)=1.06$, $p=.14$ (see Table G1). For participants who listened to Zen, the mean difference mindfulness score was 1.64 (SD=2.08) and the score for those who listened to EDM was 1.15 (SD=3.00), which are not statistically different from each other, $t(52)=.70$, $p=.24$ (see Table H1). Four separate paired t-tests were conducted in order to determine if there were significant differences between pre and post scores for each variable within each music condition. The analysis revealed that the mean of stress levels for participants who listened to the Zen music did not significantly change but did increase, $p=.36$ (see Table I1). Mean stress levels for participants who listened to the EDM song significantly decreased, $p=.018$ (see Table J1). The mean mindfulness score for participants who listened to EDM did increase and almost reached statistical significance, $p=.059$ (see Table H3). The mean mindfulness score for participants who listened to Zen music significantly increased, $p=.00023$ (see Table K1).

On average participants reported that they listened to music for a total of 4.75 hours each day. Participants reported 4 different favorite broad types of music to listen to each day.

Participants reported a total of 12 different favorite genres and 8 different subgenres of music (see Table L1). There were 11 participants whom reported pop as their favorite music genre to listen to (19.6%), 9 reported Country (16%), 6 reported Hip Hop (10.7%), 4 reported Alternative (7.1%), 3 reported rap (5.4%), and 3 reported R&B as their favorite. The remaining 35.7% of participants reported other genres, types or subgenres of music as their favorite to listen to (see Table M). Over fifty percent of participants reported feeling a moderate amount of stress daily (51.8%). Thirty-one participants reported they sometimes felt at ease after listening to music (55.4%), while 41.1% reported always feeling at ease after listening to music. Fifty-four participants declared that music was calming to listen to (96.4%).

Discussion

There were not any significant differences in stress or mindfulness measures across both conditions; therefore, the hypothesis was not supported. Previous research by Jiang et al. (2013) supports these findings. Jiang et al. (2013) found that the effects of upbeat and slower music did not significantly differ on stress levels. However, Nakajima et al. (2016) and Schellenberg's (2005) research supports positive effects of faster paced and higher frequency music on stress or an increase in mood. Additionally, Perham and Withey's (2012) as well as Schellenberg's (2005) research supports that faster paced music results in increased cognition or mindfulness. These findings suggest that Zen music and EDM music are substantially influential on mindfulness scores. However, listening to Zen music is not influential on stress levels while listening to EDM

music is positively and significantly influential on stress. The overall interpretation that can be drawn from this study is that the upbeat/ faster tempo of EDM influences a positive effect on state stress and state mindfulness while stress is significantly effective on state mindfulness scores. The majority of participants' favorite kinds of music to listen to were upbeat/faster tempo genres, which could have influenced the increase in stress levels within the Zen condition. The Zen song was 7 s longer than the EDM song, however it is unlikely that this was largely influential on the results.

Although variables such as order and fatigue effects were controlled for, limitations still arose. Online and self-report surveying could have created limitations. For future modifications to this study, the study should be held in person to observe participants actually listening to the song given to them. A larger sample size could possibly yield different results. If this study was replicated, other measures such as preference and additional genres should be analyzed. Having participants listen to music several times across a longer time span may yield more significant differences among the different conditions. The overall lack of significant differences between participants who listened to the Zen song or the EDM song suggest that listening to music in general does affect stress and mindfulness.

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Appendix A

LINDENWOOD

Informed Consent/Information/Cover Letter

“Music, Mindfulness, and Stress”

Principal Investigator: Brittany McKenzie

Telephone: (636)248-6126 E-mail: bnm925@lindenwood.edu

1. You are invited to participate in a research study conducted by Brittany McKenzie under the guidance of Dr. Michiko Nohara-LeClair. The purpose of this specific research study is to understand if simply listening to certain kinds of music will either significantly decrease stress and increase mindfulness or not.
2. a) Your participation will involve completing this online survey.

b) The amount of time involved in your participation will be 15 minutes. Approximately 50 participants or less will be involved in this research.
3. There are no anticipated risks associated with this research.
4. There are no direct benefits for you participating in this study. However, your participation will contribute to the knowledge of stress reduction and mindfulness. The possible benefits to you from participating in this research are to find out if listening to specific types of music play a role in increased scores of mindfulness and/or reduces stress levels.
5. Your participation is voluntary and you may choose not to participate in this research study or to withdraw your consent at any time. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.
6. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication or presentation that may result from this study. All answers will be anonymous even to the principle investigator and the information collected will remain in the possession of the principle investigator in a safe location.
7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Brittany McKenzie or the Supervising Faculty, Michiko Nohara-LeClair. You may also ask questions of or state concerns regarding your participation to the Lindenwood Institutional Review Board (IRB) through contacting Dr. Marilyn Abbott, Interim Provost at mabbott@lindenwood.edu or 636-949-4912.

Electronically, I consent to my participation in the research described above.

ELECTRONIC CONSENT: Please select your choice below.

Choosing to participate indicates that:

- You have read the above information.
- You voluntarily agree to participate.
- You are at least 18 years of age or have a parental consent form

Appendix B

Music, Mindfulness, and Stress Survey

I choose to participate

I choose not to participate

Write is your age in years

0400

Please answer the following seven questions which are adopted by Karanovsky, A. R. (n.d.); You have four minutes to complete all of the questions.

Please Indicate which shape on the right matches with the shape on the left (with the shape being rotated not mirrored).



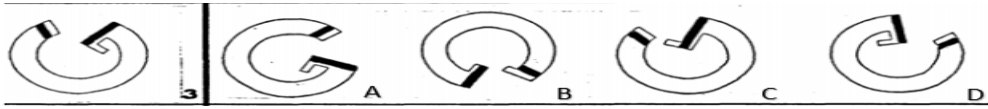
A B C D

Please Indicate which shape on the right matches with the shape on the left (with the shape being rotated not mirrored)



A B C D

Please Indicate which shape on the right matches with the shape on the left (with the shape being rotated not mirrored)



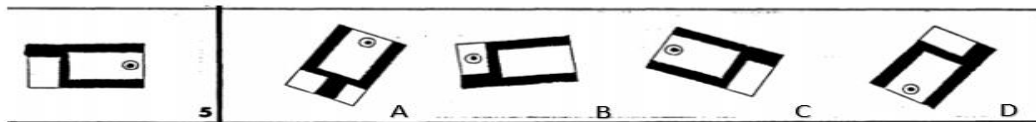
A B C D

Please Indicate which shape on the right matches with the shape on the left (with the shape being rotated not mirrored)



A B C D

Please Indicate which shape on the right matches with the shape on the left (with the shape being rotated not mirrored) Click to write the question text



A B C D

Please Indicate which shape on the right matches with the shape on the left (with the shape being rotated not mirrored) Click to write the question text



A B C D

Please Indicate which shape on the right matches with the shape on the left (with the shape being rotated not mirrored) Click to write the question text



A B C D

Please indicate the extent of your agreement or disagreement with the following statements based on your current mood.

Questions adopted from Levenstein, S., Prantera, C., Varvo, V., Scribano, M. L., Berto, E., Luzi, C., & Andreoli, A. (1993).

| | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree |
|---|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| I am irritable | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I find myself in situations of conflict | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel under pressure | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel mentally exhasuted | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel tense | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Please indicate the extent of your agreement or disagreement with following statements based on your current state of awareness.

Questions adopted from Tanay, G., & Bemstein, A. (2013).

| | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree |
|--|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| I notice pleasant and unpleasant thoughts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I notice emotions come and go | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel closely connected to the present moment | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel that I am experiencing the present moment fully | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Please take a few minutes to solely listen to this song. It is very important that you listen to the full song.



Please take a few minutes to solely listen to this song. It is very important that you listen to the full song.



On average, how much time do you spend listening to music, daily? (in minutes or hours).

What is your favorite genre of music to listen to?

Indicate the average amount of stress you feel, daily

A substantial amount
 A moderate amount
 a little
 none at all

Do you feel at ease after listening to music

Always
 Sometimes
 Never

Do you feel it is calming to listen to music?

| |
|-----|
| Yes |
| No |

Please indicate the extent of your agreement or disagreement with the following statements based on your current mood.

Questions adopted from Levenstein, S., Prantera, C., Varvo, V., Scribano, M. L., Berto, E., Luzi, C., & Andreoli, A. (1993).

| | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree |
|-------------------------|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| I feel calm | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I have many worries | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel discouraged | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I have trouble relaxing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel frustrated | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Please indicate the extent of your agreement or disagreement with following statements based on your current state of awareness.

Questions adopted from Tanay, G., & Bernstein, A. (2013)

| | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree |
|---|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| I notice thoughts come and go | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I find some of my experiences interesting | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I notice various sensations caused by my surroundings(e.g., heat, coolness, wind) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel in contact with my body | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Choose the categories that describes you:

American Indian or Alaska Native

Asian

African American or Black

Hispanic, Latino, or Spanish Origin

Middle Eastern or North African

Pacific Islander

Caucasion or White

Other

I prefer not to answer

Choose the category that describes your gender identity:

Male

Female

Nonconforming gender

Intersex

Transgender

I prefer not to answer

Appendix C



Spatial Rotation Test
Version Attached: Full Test

PsycTESTS Citation:
Karanovsky, A. R. (N.D.). Spatial Rotation Test [Database record]. Retrieved from PsycTESTS. doi:
<http://dx.doi.org/10.1037/t11238-000>

Instrument Type:
Test

Test Format:
The Spatial Rotation Test uses a multiple-choice response format.

Source:
This historic document is included through collaboration with The University of Akron, The Archives of the History of American Psychology, University Libraries.

Permissions:
Test content may be reproduced and used for non-commercial research and educational purposes. APA believes that this content is in the public domain.

Ann R. Karanovsky, Ph.D.
10 Wyman Road
Cambridge, MA 02138
U.S.A.
patent pending

Spatial Rotation Test

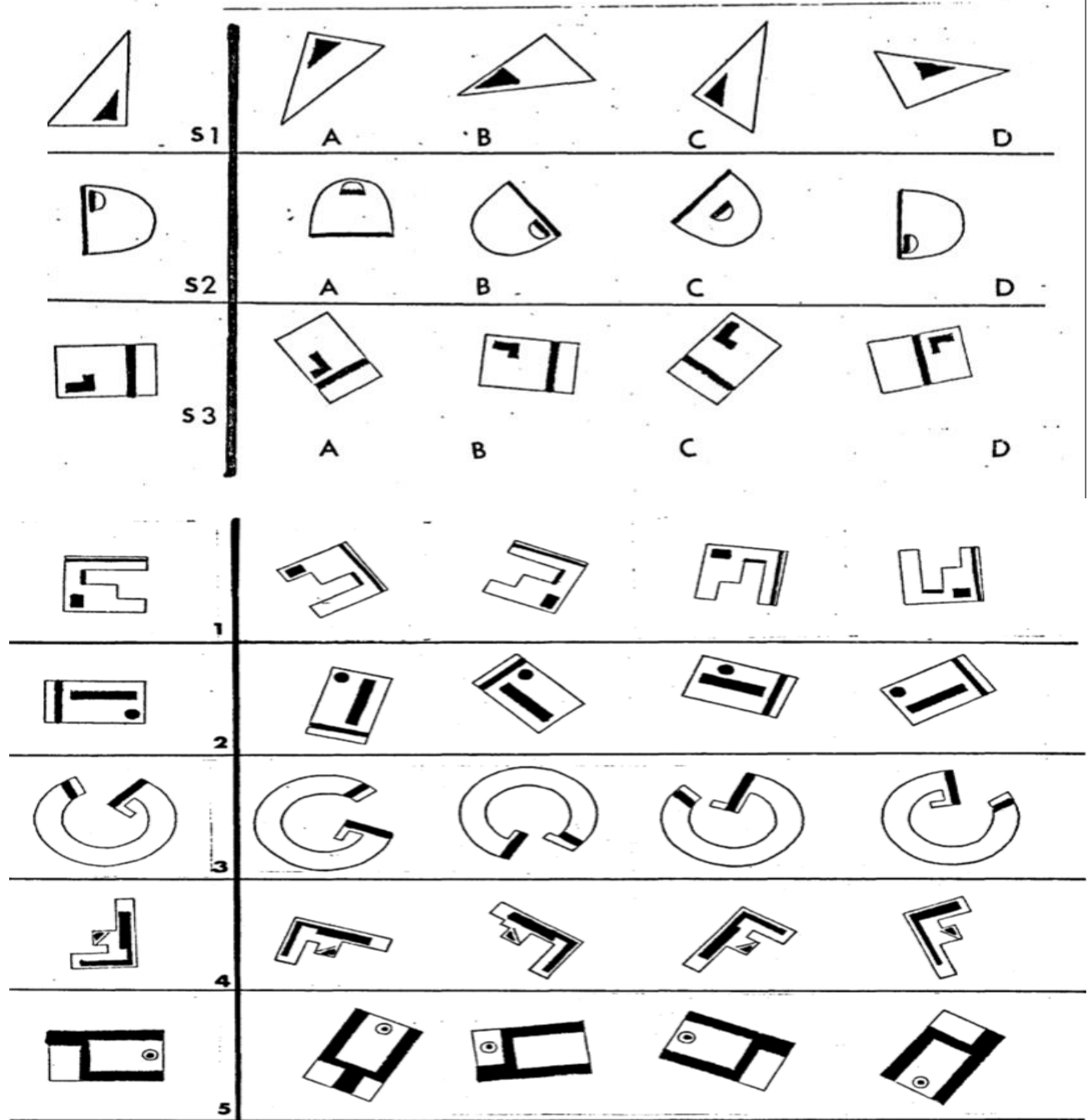
Shapes

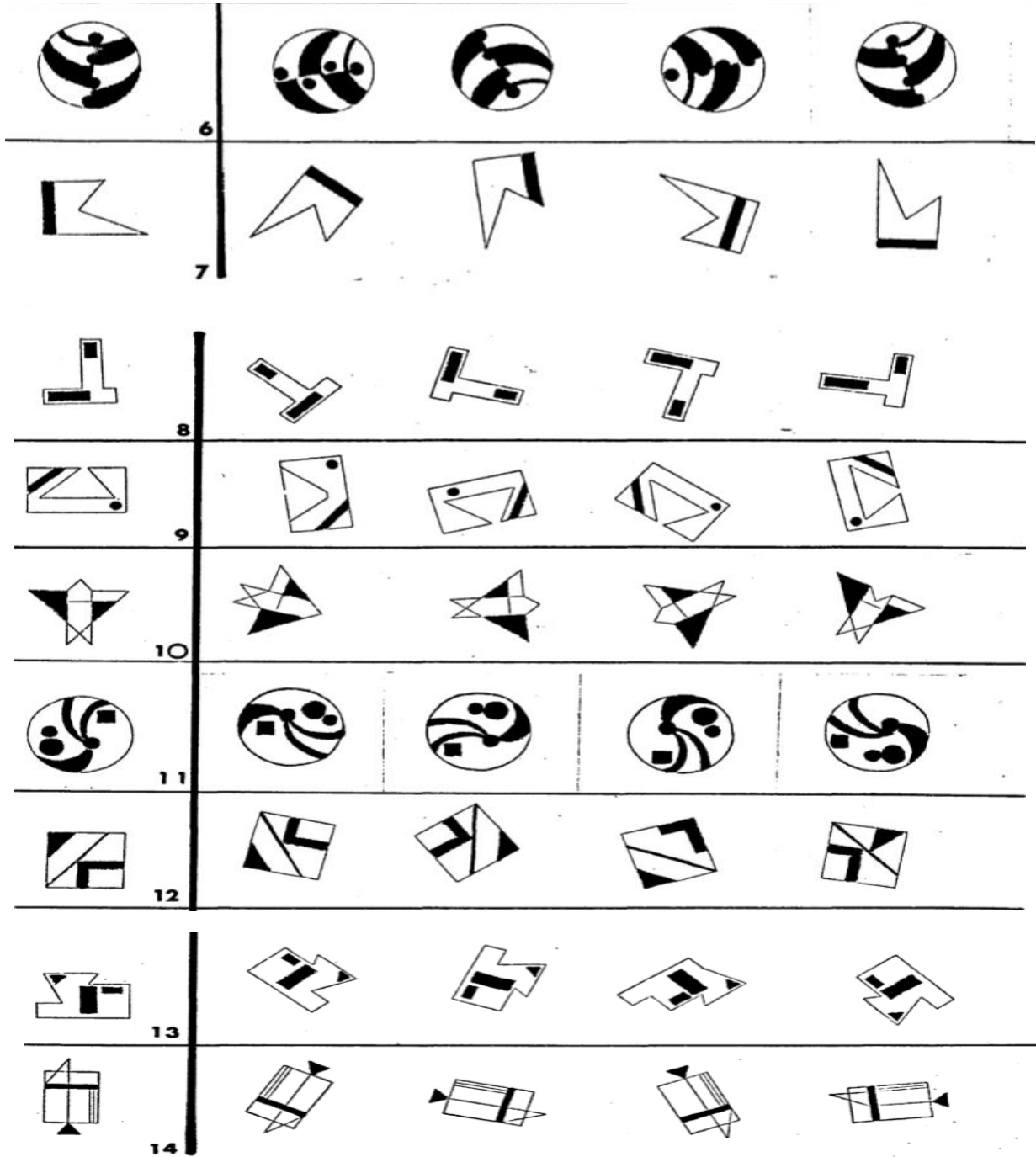
| | |
|--------------------------------------|-------------------|
| Date of Test _____ | Name _____ |
| Date of Birth _____ | School _____ |
| Age _____ | Grade _____ |
| Left handed _____ Right handed _____ | #R _____ #M _____ |

SUMMARY OF DIRECTIONS (The teacher will give full directions.)

At the bottom of this page are three sample problems. In each box at the left there is a picture, and following it are four pictures which look like it, but only one is exactly the same.

The right answer is just like the first shape, but it has been turned around in space to another position. It has not been flipped over. Put an X on the shape, in each row which is exactly like the one in the box.





Ann R. Karnovsky, Ph.D.

Appendix D



Perceived Stress Questionnaire Version Attached: Full Test

PsycTESTS Citation:

Levenstein, S., Prantera, C., Varvo, V., Scribano, M. L., Berto, E., Luzi, C., & Andreoli, A. (1993). Perceived Stress Questionnaire [Database record]. Retrieved from PsycTESTS. doi: <http://dx.doi.org/10.1037/t10467-000>

Instrument Type:

Inventory/Questionnaire

Test Format:

Responses are recorded on a 4-point scale where 1 = Almost Never, 2 = Sometimes, 3 = Often, and 4 = Usually.

Source:

Levenstein, S., Prantera, C., Varvo, V., Scribano, M. L., Berto, E., Luzi, C., & Andreoli, A. (1993). Development of the Perceived Stress Questionnaire: A new tool for psychosomatic research. *Journal of Psychosomatic Research*, Vol 37(1), 19-32. doi: 10.1016/0022-3999(93)90120-5, © 1993 by Elsevier. Reproduced by Permission of Elsevier.

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doi: 10.1037/t10467-000

Perceived Stress Questionnaire
PSQ

Items

Instructions for the General questionnaire : For each sentence, circle the number that describes how often it applies to you in general, *during the last year or two*. Work quickly, without bothering to check your answers, and be careful to describe your life *in the long run*.

| | Almost | | | |
|--|--------|-----------|-------|---------|
| | never | Sometimes | Often | Usually |
| 1. You feel rested | 1 | 2 | 3 | 4 |
| 2. You feel that too many demands are being made on you | 1 | 2 | 3 | 4 |
| 3. You are irritable or grouchy | 1 | 2 | 3 | 4 |
| 4. You have too many things to do | 1 | 2 | 3 | 4 |
| 5. You feel lonely or isolated | 1 | 2 | 3 | 4 |
| 6. You find yourself in situations of conflict | 1 | 2 | 3 | 4 |
| 7. You feel you're doing things you really like | 1 | 2 | 3 | 4 |
| 8. You feel tired | 1 | 2 | 3 | 4 |
| 9. You fear you may not manage to attain your goals | 1 | 2 | 3 | 4 |
| 10. You feel calm | 1 | 2 | 3 | 4 |
| 11. You have too many decisions to make | 1 | 2 | 3 | 4 |
| 12. You feel frustrated | 1 | 2 | 3 | 4 |
| 13. You are full of energy | 1 | 2 | 3 | 4 |
| 14. You feel tense | 1 | 2 | 3 | 4 |
| 15. Your problems seem to be piling up | 1 | 2 | 3 | 4 |
| 16. You feel you're in a hurry | 1 | 2 | 3 | 4 |
| 17. You feel safe and protected | 1 | 2 | 3 | 4 |
| 18. You have many worries | 1 | 2 | 3 | 4 |
| 19. You are under pressure from other people | 1 | 2 | 3 | 4 |
| 20. You feel discouraged | 1 | 2 | 3 | 4 |
| 21. You enjoy yourself | 1 | 2 | 3 | 4 |
| 22. You are afraid for the future | 1 | 2 | 3 | 4 |
| 23. You feel you're doing things because you have to not because you want to | 1 | 2 | 3 | 4 |
| 24. You feel criticized or judged | 1 | 2 | 3 | 4 |
| 25. You are lighthearted | 1 | 2 | 3 | 4 |
| 26. You feel mentally exhausted | 1 | 2 | 3 | 4 |
| 27. You have trouble relaxing | 1 | 2 | 3 | 4 |
| 28. You feel loaded down with responsibility | 1 | 2 | 3 | 4 |
| 29. You have enough time for yourself | 1 | 2 | 3 | 4 |
| 30. You feel under pressure from deadlines | 1 | 2 | 3 | 4 |

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doi: 10.1037/t10467-000

**Perceived Stress Questionnaire
PSQ**

Items

Instructions for the Recent questionnaire

For each sentence, circle the number that describes how often it applied to you *during the last month*.
Work quickly, without bothering to check your answers, and be careful to consider only *the last month*.

Score 5-circled number for items 1, 7, 10, 13, 17, 21, 25, 29

Score circled number for all other items

PSQ Index = (raw score—30)/90.

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Appendix E



State Mindfulness Scale
Version Attached: Full Test

PsycTESTS Citation:

Tanay, G., & Bernstein, A. (2013). State Mindfulness Scale [Database record]. Retrieved from PsycTESTS. doi: <http://dx.doi.org/10.1037/t29421-000>

Instrument Type:
Rating Scale

Source:

Tanay, Galia, & Bernstein, Amit. (2013). State Mindfulness Scale (SMS): Development and initial validation. *Psychological Assessment*, Vol 25(4), 1286-1299. doi: 10.1037/a0034044

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doi: 10.1037/t29421-000

**State Mindfulness Scale
SMS**

Items

7. I noticed pleasant and unpleasant emotions.
13. I noticed pleasant and unpleasant thoughts.
14. I noticed emotions come and go.
1. I was aware of different emotions that arose in me.
5. I felt aware of what was happening inside of me.
21. I was aware of what was going on in my mind.
18. I felt closely connected to the present moment.
17. I had moments when I felt alert and aware.
8. I actively explored my experience in the moment.
12. I felt that I was experiencing the present moment fully.
2. I tried to pay attention to pleasant and unpleasant sensations.
22. It was interesting to see the patterns of my thinking.
4. I noticed many small details of my experience.
19. I noticed thoughts come and go.
3. I found some of my experiences interesting.
16. I noticed physical sensations come and go.
23. I noticed some pleasant and unpleasant physical sensations.
15. I noticed various sensations caused by my surroundings (e.g., heat, coolness, the wind on my face).
9. I clearly physically felt what was going on in my body.
20. I felt in contact with my body.
10. I changed my body posture and paid attention to the physical process of moving.

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Appendix F

Thank You Statement

Thank you for taking the time to complete this survey for my class project at Lindenwood University. The hypothesis of this project states that stress will significantly reduce after listening to the meditation music while mindfulness scores will significantly increase. The last hypothesis states that electronic dance music will not improve either measure. Results would then add to the understanding of whether or not just listening to meditation music can bring any benefits. Knowing how either genre of music affects your emotional state or mental function can in turn possibly influence you to better determine which music is more beneficial to listen to.

If you would like to see the results of my survey, please feel free to contact me using the contact information below. Again, thank you very much for your time and effort!

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Appendix G

Table 1

| Stress Levels | | |
|------------------------------|-------------|--------------|
| | <i>ZEN</i> | <i>EDM</i> |
| Mean | 0.321428571 | -0.846153846 |
| Variance | 13.55952381 | 19.33538462 |
| Observations | 28 | 26 |
| Pooled Variance | 16.33637997 | |
| Hypothesized Mean Difference | 0 | |
| df | 52 | |
| t Stat | 1.060665501 | |
| P(T<=t) one-tail | 0.146871834 | |
| t Critical one-tail | 1.674689154 | |
| P(T<=t) two-tail | 0.293743668 | |
| t Critical two-tail | 2.006646805 | |

Appendix H

Table 1

| Mindfulness Scores | | |
|------------------------------|-------------|-------------|
| | <i>ZEN</i> | <i>EDM</i> |
| Mean | 1.642857143 | 1.153846154 |
| Variance | 4.312169312 | 9.015384615 |
| Observations | 28 | 26 |
| Pooled Variance | 6.573330516 | |
| Hypothesized Mean Difference | 0 | |
| df | 52 | |
| t Stat | 0.70031704 | |
| P(T<=t) one-tail | 0.243425499 | |
| t Critical one-tail | 1.674689154 | |
| P(T<=t) two-tail | 0.486850999 | |
| t Critical two-tail | 2.006646805 | |

Appendix I

Table 1

| <i>Zen Music</i> | <i>PreStress</i> | <i>Poststress</i> |
|---------------------|------------------|-------------------|
| Mean | 15.3333333 | 15.5925926 |
| Variance | 19.6923077 | 10.7891738 |
| Observations | 27 | 27 |
| Pearson Correlation | 0.56643341 | |
| Hypothesized Mean | 0 | |
| df | 26 | |
| t Stat | -0.3604448 | |
| P(T<=t) one-tail | 0.36071319 | |
| t Critical one-tail | 1.70561792 | |
| P(T<=t) two-tail | 0.72142638 | |
| t Critical two-tail | 2.05552944 | |

Appendix J

Table 1

| Column1 | Column2 | Column3 |
|---------------------|------------------|-------------------|
| EDM | | |
| | <i>PreStress</i> | <i>PostStress</i> |
| Mean | 16.4 | 14.96 |
| Variance | 20.83333333 | 11.37333333 |
| Observations | 25 | 25 |
| Pearson Correlation | 0.702159 | |
| Hypothesized Mean | 0 | |
| df | 24 | |
| t Stat | 2.2125063 | |
| P(T<=t) one-tail | 0.01834745 | |
| t Critical one-tail | 1.71088208 | |
| P(T<=t) two-tail | 0.03669491 | |
| t Critical two-tail | 2.06389856 | |

Appendix K

Table 1

| <i>Zen Music</i> | <i>PreMind.</i> | <i>PostMind.</i> |
|---------------------|-----------------|------------------|
| Mean | 14.4444444 | 16.0740741 |
| Variance | 7.33333333 | 7.53276353 |
| Observations | 27 | 27 |
| Pearson Correlation | 0.69918135 | |
| Hypothesized Mean | 0 | |
| df | 26 | |
| t Stat | -4.0038198 | |
| P(T<=t) one-tail | 0.00023144 | |
| t Critical one-tail | 1.70561792 | |
| P(T<=t) two-tail | 0.00046287 | |
| t Critical two-tail | 2.05552944 | |

Appendix L

Table 1

| Column1 | Column2 | Column3 |
|---------------------|-----------------|------------------|
| EDM | | |
| | <i>PreMind.</i> | <i>PostMind.</i> |
| Mean | 14.72 | 15.56 |
| Variance | 5.21 | 4.75666667 |
| Observations | 25 | 25 |
| Pearson Correlation | 0.32575521 | |
| Hypothesized Mean | 0 | |
| df | 24 | |
| t Stat | -1.6197835 | |
| P(T<=t) one-tail | 0.05917299 | |
| t Critical one-tail | 1.71088208 | |
| P(T<=t) two-tail | 0.11834598 | |
| t Critical two-tail | 2.06389856 | |

Appendix M

| | Music | Total |
|----------|------------------|-------|
| | Everything | 1 |
| Type | Upbeat/ Dance | 1 |
| Type | Instrumental | 1 |
| Type | Acoustic | 1 |
| Type | Slow/ Sad | 1 |
| Genre | Pop | 11 |
| Genre | Hip Hop | 6 |
| Genre | Indie | 2 |
| Genre | Rap | 3 |
| Genre | R&B | 1 |
| Genre | Country | 9 |
| Genre | Reggae | 2 |
| Genre | Rock | 3 |
| Genre | Electronic | 1 |
| Genre | Alternative | 4 |
| Genre | Folk | 2 |
| Genre | New Age | 1 |
| Genre | Classical | 1 |
| Subgenre | EDM | 2 |
| Subgenre | Techno | 1 |
| Subgenre | Synthwave | 1 |
| Subgenre | Dubstep | 1 |
| Subgenre | Tropical house | 1 |
| Subgenre | Punk | 1 |
| Subgenre | Chill Pop | 1 |
| Subgenre | Bluegrass | 1 |
| Subgenre | Classic Rock | 3 |
| Subgenre | Alternative Rock | 1 |