Possibilities for Managing Stress during Periods of High-Intensity Academic Work: A Single-Subject Investigation

The primary objective of this research is to test for the level of effectiveness in controlling stress by implementing common stress management techniques in students completing high-intensity academic work. In a 5-week, single-subject investigation of a student completing her senior thesis, the following stress management package was implemented using an A1-A2-B-A2-B design of treatment and withdrawal: 30-40 minute daily exercise routine accompanied by a nightly routine of breathing exercises followed by visualization and nightly affirmations. The results indicated that although stress cannot be mitigated completely during high-stress periods through the use of these techniques, stress management can be incorporated to successfully keep anxiety at a more manageable level.

Introduction

Most people experience school and work-related stress regularly throughout their lives. In order to manage this form of anxiety, psychologists have developed various mental and physical stress management techniques that individuals can implement into their daily routines. However, the level of stress that these methods aim to target are significantly lower from the elevated levels in stress that occur when people are performing particularly demanding tasks in their education or career. These may include writing a graduate dissertation or preparing a particularly large project for work. In a study by Shinobu et al. (2007), the researchers measured the episodic stress in Japanese students that was associated with writing a graduation thesis, by accounting for cortisol secretions that have been proven to be associated with abnormally increased stress. They found that, similar to patients with post-traumatic stress disorder, students writing their senior
theses also exhibited increased salivary cortisol levels correlated with their approaching deadlines. The fact that an abnormally high stress-inducing event can even lead to hormonal changes suggests that steps should be taken to attempt to manage stress and to avoid lasting damaging effects.

This research seeks to gain a better understanding of whether it is possible to decrease the intense stress levels associated with completing an honors thesis paper through the use of common stress management techniques that include daily exercise, breathing exercises, visualization, and nightly affirmations. I ask: Does the data indicate that the implementation of a stress package in a student in a high-stress situation result in diminished stress levels? Are there any additional positive effects that result from the use of a stress package? If these techniques do not have any effect, would it be beneficial to alter or develop new methods for controlling stress for people under circumstances of more extreme and elongated stress? I hypothesize that although the existing techniques will result in slightly lowering manifestations of stress, they will need to be used in non-traditional ways in order to have a significant impact in people who are experiencing a period of high-intensity stress.

**Method**

**Design**

The aim of this study is to measure the helpfulness of stress relieving activities on students who are undergoing atypically high levels of stress. In order to gain a more in-depth understanding of the effect of a multifaceted stress management package, I will incorporate a 5-week, single-subject design of treatment and withdrawal. By observing only one subject, this will enable me
to look at the effects of therapy in a way that is more comprehensive than that of traditional multi-subject designs.

Participant

The participant that I have selected for observation is a 22-year old female student who is currently completing the final year of her undergraduate degree. She is a Sociology major who has been in the process of conducting an honors thesis project for over a year now. The fact that she has been performing high-stress work for a sustained amount of time prior to the study creates the conditions that are essential for the purpose of monitoring elongated periods of intensive stress. Additionally, during the time that this research was carried out the student was approaching the final deadline to submit her written work. Similar to the study conducted by Shinobu et al. (2007), this enables us to identify a correlation between the approaching deadline and increased stress levels.

Procedure

According to popular literature and previous research in the psychology of stress management, the methods to reduce stress vary from person to person in effectiveness. For some, exercises stimulating the body lead to a mitigating effect, while for others, exercises changing the mental state are more beneficial. In order to account for individual differences, I implement a four-part stress package of physical exercise, breathing exercises, visualization, and nightly affirmations, which balances both physical and mental stress relievers. The stress package will be incorporated and subsequently withdrawn over a period of 5 weeks as follows:

1 See the Appendix for further explanation of the specific exercises that were incorporated.
-Week 1—Baseline measurements will be taken to measure the level of stress without the practice of stress-relieving activities.

-Week 2—Stress package will be incorporated and initial, short-term effects determined.

-Week 3—Stress package continued and effects will be measured for the second week.

-Week 4—Stress package will be withdrawn and the effects of removal are measured.

-Week 5—Stress package reincorporated and comparison will be done between weeks with and without it to determine the level of effectiveness.

Results

Figure 1 presents the recorded levels of stress during the 5-week program. From the results, it is evident that as expected, the stress package had varying, minor success. During the first week, the average baseline level of stress was valued at approximately 7.4 on a scale of 1-10 (10 being the most stress). In the second week and after the program had been incorporated for the first time, the stress decreased slightly to about 6.1, which suggests that the stress management activities functioned in reducing stress slightly. In the third week, or, the second week of the program, the average level of stress rose to approximately 7.1, showing that the activities did not have the effect of maintaining decreased stress. However, in the fourth week the program was revoked, and there was a minor elevation in stress that was measured as about 8.1. This result indicates that the stress management activities did help to slightly control stress, as when it was removed the stress levels were increased. When the program was reinstated in the final week this finding was confirmed, as stress levels decreased again to approximately 7.1.
Discussion

As was hypothesized, the implementation of a stress management package resulted in a slight decrease in the overall level of stress experienced by the student. This was demonstrated by the fact that when the program was in use, the stress levels were lower than that of the baseline period and well as when it was withdrawn. This suggests that there are possibilities for reducing stress in individuals experiencing substantial periods of intensive school or work-related activity. Moreover, even though the techniques that were implemented in this study only resulted in minor differences in stress and were not necessarily a full “solution”, it appears that there is worth incorporating them because sustained high-stress periods (especially in older
people and those with prior health problems) can be detrimental to individuals’ physical and mental wellbeing.
References

Appendix

Description of the Activities Included in the Stress Management Package

I. Daily Gym Work Out (done each day in the late afternoon)

This started with a 10-minute warm-up of cardio (heart rate ~135bpm), accompanied by 5 minutes of light, full body stretching. Then, the participant completed 20 minutes of basic functional training that involved the following prehab, movement prep, and strength exercises:

(Prehab)—Posterior rocking, hip external rotation, and glute bridge

(Movement Prep)—Walking lunge forward and backward, and leg cradle

(Strength)—1/4 squat, W’s, and wall pushups

Lastly, the participant completed 20 minutes of cardio (heart rate ~150-165bpm), followed by a 2-minute warm down.

II. Breathing Exercises (done in the evening before bed)

The following exercises were incorporated (excerpted from Dr.Weil.com):


**Exercise 2: The 4-7-8 (or Relaxing Breath) Exercise**

This exercise is utterly simple, takes almost no time, requires no equipment and can be done anywhere. Although you can do the exercise in any position, sit with your back straight while learning the exercise. Place the tip of your tongue against the ridge of tissue just behind your upper front teeth, and keep it there through the entire exercise. You will be exhaling through your mouth around your tongue; try pursing your lips slightly if this seems awkward.

Exhale completely through your mouth, making a whoosh sound. Close your mouth and inhale quietly through your nose to a mental count of **four**. Hold your breath for a count of **seven**. Exhale completely through your mouth, making a whoosh sound to a count of **eight**. This is one breath. Now inhale again and repeat the cycle three more times for a total
of four breaths.

Note that you always inhale quietly through your nose and exhale audibly through your mouth. The tip of your tongue stays in position the whole time. Exhalation takes twice as long as inhalation. The absolute time you spend on each phase is not important; the ratio of 4:7:8 is important. If you have trouble holding your breath, speed the exercise up but keep to the ratio of 4:7:8 for the three phases. With practice you can slow it all down and get used to inhaling and exhaling more and more deeply.

This exercise is a natural tranquilizer for the nervous system. Unlike tranquilizing drugs, which are often effective when you first take them but then lose their power over time, this exercise is subtle when you first try it but gains in power with repetition and practice. Do it at least twice a day. You cannot do it too frequently. Do not do more than four breaths at one time for the first month of practice. Later, if you wish, you can extend it to eight breaths. If you feel a little lightheaded when you first breathe this way, do not be concerned; it will pass.

Once you develop this technique by practicing it every day, it will be a very useful tool that you will always have with you. Use it whenever anything upsetting happens - before you react. Use it whenever you are aware of internal tension. Use it to help you fall asleep. This exercise cannot be recommended too highly. Everyone can benefit from it.

**Exercise 3: Breath Counting** If you want to get a feel for this challenging work, try your hand at breath counting, a deceptively simple technique much used in Zen practice.

Sit in a comfortable position with the spine straight and head inclined slightly forward. Gently close your eyes and take a few deep breaths. Then let the breath come naturally without trying to influence it. Ideally it will be quiet and slow, but depth and rhythm may vary.

To begin the exercise, count "one" to yourself as you exhale. The next time you exhale, count "two," and so on up to "five." Then begin a new cycle, counting "one" on the next exhalation.

Never count higher than "five," and count only when you exhale. You will know your attention has wandered when you find yourself up to "eight," "12," even "19."
Try to do 10 minutes of this form of meditation.

III. Visualization (done following the breathing exercises)

Visualization was carried out using the following relaxation script:

http://www.innerhealthstudio.com/visualization-relaxation.html

**Start reading the beach visualization relaxation script here:**

Get comfortable. Sit in a supportive chair or lie on your back.

Relax your body by releasing any areas of tension. Allow your arms to go limp... then your legs....

Feel your arms and legs becoming loose and relaxed...

Now relax your neck and back by relaxing your spine.... release the hold of your muscles all the way from your head, down your neck....along each vertebra to the tip of your spine...

Breathe deeply into your diaphragm, drawing air fully into your lungs.... and release the air with a whooshing sound....

Breathe in again, slowly.... pause for a moment.... and breathe out.....

Draw a deep breath in.... and out....

In..... out.....

Become more and more relaxed with each breath....

Feel your body giving up all the tension.... becoming relaxed.... and calm.... peaceful....

Feel a wave of relaxation flow from the soles of your feet, to your ankles, lower legs, hips, pelvic area, abdomen, chest, back, hands, lower arms, elbows, upper arms, shoulders, neck, back of your head, face, and the top of your head....
Allow your entire body to rest heavily on the surface where you sit or lie. Now that your body is fully relaxed, allow the visualization relaxation to begin.

Imagine you are walking toward the ocean.... walking through a beautiful, tropical forest....

You can hear the waves up ahead.... you can smell the ocean spray.... the air is moist and warm.... feel a pleasant, cool breeze blowing through the trees....

You walk along a path....coming closer to the sea....as you come to the edge of the trees, you see the brilliant aqua color of the ocean ahead....

You walk out of the forest and onto a long stretch of white sand.... the sand is very soft powder.... imagine taking off your shoes, and walking through the hot, white sand toward the water....

The beach is wide and long....

Hear the waves crashing to the shore....

Smell the clean salt water and beach....

You gaze again toward the water.... it is a bright blue-green....

See the waves washing up onto the sand..... and receding back toward the ocean.... washing up.... and flowing back down..... enjoy the ever-repeating rhythm of the waves...

Imagine yourself walking toward the water.... over the fine, hot sand.... you are feeling very hot....

As you approach the water, you can feel the mist from the ocean on your skin. You walk closer to the waves, and feel the sand becoming wet and firm....

A wave washes over the sand toward you.... and touches your toes before receding...
As you step forward, more waves wash over your feet... feel the cool water provide relief from the heat....

Walk further into the clear, clean water.... you can see the white sand under the water.... the water is a pleasant, relaxing temperature.... providing relief from the hot sun... cool but not cold....

You walk further into the water if you wish.... swim if you want to.... enjoy the ocean for a few minutes..... allow the visualization relaxation to deepen.... more and more relaxed... enjoy the ocean....

Now you are feeling calm and refreshed...

You walk back out of the water and onto the beach...

Stroll along the beach at the water's edge.... free of worries... no stress... calm..... enjoying this holiday....

Up ahead is a comfortable lounge chair and towel, just for you...

Sit or lie down in the chair, or spread the towel on the sand.... relax on the chair or towel.... enjoying the sun.... the breeze.... the waves.....

You feel peaceful and relaxed.... allow all your stresses to melt away....

When you are ready to return from your vacation, do so slowly....

Bring yourself back to your usual level of alertness and awareness....

Keep with you the feeling of calm and relaxation.... feeling ready to return to your day....

Open your eyes, stretch your muscles... and become fully alert... refreshed... and filled with energy.
You can practice this visualization relaxation as often as you wish, to provide a mental vacation whenever you need it. Visualization relaxation is a skill that can be learned; the more you practice, the more skilled you will become and more effectively you will be able to relax using visualization relaxation.

IV. Affirmations

The following affirmations were repeated each night following the visualization exercise:

*I am doing my best, and that is all that I can do.*

*I am taking care of myself by taking some time to relax.*

*I believe in myself.*

The above affirmations were developed using the Mental Training activity, by K. Porter (2003).

See below for more information.
Table 4.2: Affirmations for Letting Go of a Goal

- I let go of my goals for ___________ and open myself to new possibilities.
- I acknowledge my strength and learning gained in the process of going for my goals.
- I did the best I could do in striving for my goal.
- It is easy for me to let go of the past and look toward the future.
- I am enjoying the present.
- I am taking care of myself, resting, and relaxing.
- It is time for me to move on to new challenges.
- I find new things to inspire and challenge me in new ways.
- It is okay for me to feel sad or depressed. I am mourning the passing of a way of life for me.
- I am proud of my dedication and achievements in my competitive years.
- I acknowledge myself and my abilities.
- Being ranked ___ in the world is a fine achievement.
- I am proud of myself and the goals that I achieved.
- We all did the best we could do during the competition.
- My future is filled with abundance and prosperity.
- I trust and believe in myself.
- I let go of the past and move on.
- I forgive myself with love and acceptance.
- My mind and body are at peace.
- I am grateful for my healthy body, my good mind, and my fitness.
- I am grateful for all the support I received from my family, teammates, friends, and coaches.
- I am grateful for my achievements and honors, my energy and creativity, and the opportunity to compete at world-class levels.
- I am grateful for the abundance in my life.

What you want to do is change negative thoughts so they support you and help you to know that you are in control. Affirmations are "I am" statements. They are the reverse of your negative, limiting self-talk. You may not feel that they are true at this moment. When you were learning all the limiting self-beliefs, they were also untrue, but because you bought the idea—someone else’s idea—you made these beliefs part of your own reality. You now know that you can create your own reality. You can create a positive, unlimited, supportive self-reality. It's a matter of buying a new set of beliefs, beliefs that are positive and self-nurturing.

Take a look at your negative thoughts from Mental Trainer #4. How can you make these positive, present tense, and personal? Now, use Mental Trainer #5 to help turn your previously negative thoughts into positive self-statements.

The harder it is to form a positive statement from one of your negative beliefs, the better it will be for you, and the more important it is to change it to a positive self-statement. For example, you may write, "I am strong and confident and capable of beating anyone at this competition." When you write this, if it feels strange in the pit of your stomach, or if you laugh and shake your head, or if it is difficult to write down and say to yourself, then it

Mental Trainer #5: Transformers

**Negative thought 1:** My thesis needs to be perfect
**Positive affirmation:** I am doing my best and that is all that I can do.

**Negative thought 2:** I am not working on my thesis I am procrastinating
**Positive affirmation:** I am taking care of myself by ____________

**Negative thought 3:**
**Positive affirmation:** I am ____________