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A Teaching Strategy for Successful Hand Warming[1]

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"I truly feel relaxed."

"I did not know it was possible. I opened up my eyes after following the guided instructions and my finger temperature had increased from 78° to 96° Fahrenheit. I literally can feel the warmth in my hands and a slight pulsing in my fingers. I now know I can influence my health. I wonder if I can get rid of my chronic irritable bowel?"

Increasing peripheral hand temperature is a powerful demonstration that voluntary self-control is possible. Peripheral warming with temperature biofeedback is also one of the common biofeedback approaches for the treatment of vascular related disorders such as migraine (Green and Green, 1989; Peper and Grossman, 1976; Fahrion, 1977) and Raynauds Disease (Freedman, 1987; Sedlacek, 1989). It is also used in the self-regulation of blood pressure (Fahrion et al, 1986; Blanchard, 1990), as part of general stress management and an integral part of many relaxation procedures (Schwartz, 1995). Although, it can be used as a treatment approach, peripheral hand warming is a strategy to demonstrate passive attention. This is a non-striving way of being with the soma and experiencing that an autonomic physiological function can be voluntarily influenced.

This essay outlines a successful approach used in groups to elicit rapid peripheral warming as a strategy to encourage learning and personal beliefs. It is an useful tool to demonstrate to an audience to the value of a biofeedback approach to mobilize health. Through this educational/clinical strategy, almost all participants experience an increase in hand temperature. The experimental data of 219 subjects who participated in this structured temperature warming experiment is included.

A Structured Group Experience

The structured guided imagery practice is an integral component of our general lectures on stress management, healthy computing training seminars, specialized skill learning in peak performance training and specific treatment protocols in which peripheral warming is indicated. We recommend teaching this procedure in groups because most participants will experience an increase in peripheral temperature. For the few for whom there is no or very

[1] For more detail see: Peper, E., Gibney, K.H. & Holt. C. (2002). *Make Health Happen: Training Yourself to Create Wellness.* Dubuque, IA: Kendall-Hunt.

little change, or for whom the temperature decreases, they observe that almost all people were successful in significantly increasing their peripheral temperature. Hence, the group experience reverses the skepticism that often occurs when individual subjects do not increase peripheral temperature. Instead of knowing that temperature does not increase, they now observe that it is a natural skill and can occur in most participants.

This practice is adapted from the integrated practice described by Peper and Holt (1993) and integrates the components from Quieting Reflex (Stroebel, 1982), guided mental focus (Cousins, 1982), and breathing (Peper, 1990).

Instructions:

The exercise sequence is done in the middle of a lecture after participants have adapted to the room temperature. The following steps are detailed below:

1. Develop an atmosphere of fun and exploration in which passive attention is enhanced
2. Quieting Reflex with touch role rehearsal
3. Handout small glass thermometers and record index finger thumb temperature (Pre-measure).
   (Optional: Hand out an optional data sheet to record room temperature and subjective experience.)
4. Guide an integrated relaxation, focus of attention and breathing practice (approximately 7 minutes)
5. Record the temperature of the index-thumb finger (Post-measure)
6. Record the temperature data on the black board
7. Discuss subjective experiences and implications of these experiences

1. Develop an atmosphere of fun and exploration in which passive attention is enhanced.

Begin the sequence of the practice by setting a framework that you want to teach some useful self-regulation skills. You would like to teach a rapid stress reduction technique that can be done anywhere. We usually discuss this with humor (e.g., if I became stressed when I saw my supervisor and I needed 20 minutes to lie down to practice relaxation—my supervisor would not appreciate it). Therefore, we need to learn a technique that takes only three seconds (e.g., something I could do while standing in line at the supermarket even though they promised that they would open another register if there were more than three people in line—except when I am there!). In addition, it is assumed that the instructor is himself/herself successful in warming his/her own hands. If one can do it, then there is no issue of belief. One knows it is possible. This knowing is covertly communicated to the audience and will facilitate hand warming (Peper and Sandler, 1987).

2. Quieting Reflex with touch role rehearsal (about 10 minutes)

Begin with a short discussion of a simple stress response (fight/flight alarm reaction). We usually model and exaggerate this reaction in front of the audience by showing how our bodies would react to a very loud noise (e.g., we gasp and hold our breath, clench our jaw, frown, flex our arms, etc.). Then we make the point that we do this unknowingly many times during the day (e.g., when the phone rings, during traffic when some one cuts in front of you). Laughter and heads nodding confirmation of this response pattern usually follow. We then point out that in many cases this reaction carries is a significant personal cost because they have no control over the stressors. They just need to learn to control or inhibit their own response. The process includes 1) recognition of the beginning of the stressor and stress reaction and 2) use of the stress reaction to automatically trigger the opposite body responses. This anti-stress response consists of a smile to stop the frowning; gentle diaphragmatic breathing to counter the breath holding; a gentle exhalation while loosening the jaw and shoulders, to relax the tense jaw; and imagining the breath flowing out while allowing hand warming (to reduce the sympathetic arousal).

After the discussion, practice this change in alarm response with the audience (e.g., clap your hands loudly and, in response to this startle, ask them to smile, take a deep breath, exhale through their mouths allowing their jaws to relax and their shoulders to drop, while imagining their breath flowing down their arms). We then ask, "How many of you feel air flowing through your arms." Most will usually confirm the feeling. With humor we respond that many of our engineering clients look at us strangely and say, "I know you are a professor at the University, however, I know air goes out of my nose and mouth and not through my arms!" At this point we would agree with them and explain that we mean it is a felt sense of going down their arms. This felt sense is then illustrated in front of the audience with a volunteer.

The volunteer stands facing one of us and we explain that we will rehearse the quieting reflex. Namely, we will clap and, in response to the clap, he will smile, take a gentle breath and, while loosening his jaw, exhale down his arms. As he exhales, we begin stroking from his shoulders down his arms and hands. (Remember, as you stroke down the arms you are role modeling relaxation and exhaling at the same time as the volunteer.) The touching down the arms is performed in rhythm with his exhalation. Often we squeeze the arms as if squeezing the toothpaste out his fingers. This demonstration usually results in the volunteer reporting that he feels better and more relaxed.

After the demonstration, have the audience work in pairs practicing with each other while standing. Allow them to do this to each other for three or four breaths each.

When done, let every one sit down and explain how they can now do this Quieting Response in many situations. It can be done during meetings, each time the phone rings, when they think of family conflict, distressing thoughts etc. Remind them that, if they practice this many times during the day, many symptoms such as tension headaches and hypertension will be reduced.

We point out that the purpose of imagining blowing air down their arms is to elicit hand warming as a way to reduce sympathetic arousal since many people experience cold hands under stress. Hence, let's practice learning hand warming.

3. Handout small glass thermometers (optional data sheet to record room temperature, subjective experience and index finger thumb temperature - Pre-measure).

For systematic studies we handout a short data collection form to record the room temperature, age and sex and subjective experience of stress as shown in Figure 1.

Small glass hand thermometers are handed out with the instructions that they initially do not hold the bulb but look and record the room temperature. The initial temperature of the thermometer reflects the room temperature.

Then instruct the participants to hold the bulb end of the thermometer between their right index and thumb while letting their hands relax on their laps. (Option: tape the thermometer to the tip of the index finger.)

After two minutes of holding the thermometer, they record their index finger-thumb temperature (Pre measure). They are then instructed to sit comfortably on their chair with their hands on resting on their lap while still holding the thermometer as is shown in Fig. 2.

Figure 2: Holding thermometer between fingers

Date:_____ Time:_____ Gender:___ M ___F Age:_____

Room Temperature _____

PRE: Hold thermistor between right thumb and index finger

.

Pre Temp:_____

Rate how you feel (Please circle)

Relaxed Tense

0 1 2 3 4 5 6 7 8 9

Describe:

_____

_____

_____

_____

_____

_____

****

Imagery exercise

****

POST Temp:_____

Rate how you feel (Please circle)

0 1 2 3 4 5 6 7 8 9

Relaxed Tense

Describe:

_____

_____

_____

_____

_____

_____

Calculate temperature change: Post temp – Pre temp = _____

Figure 1: Short temperature assessment form

4. Guide an integrated relaxation, focus of attention and breathing practice (approximately 7 minutes)

Read this script to the audience. (…. means wait a few moments before going on.)

Wiggle around…. Sit comfortably in the chair, let your weight just rest against the back of the chair and seat of the chair…Allow your eyes to close; if you want to keep them open, that is all right too.

Now press together your ankles, now knees and continue pressing while tightening your buttocks, raising your shoulders and frowning. Hold this for the count of 10…. Now let go and relax and let your eyes be closed… Feel your body relaxing and being supported by the chair… Just keep gently holding the thermometer between your thumb and index finger. In case you relax so much that the thermometer drops just pick it up again and continue with the exercise.

Now think back on a nice memory. Think of the nicest thing that happened to you—something that made you feel very good at that time. When you think of this memory, just nod your head…. (Usually, it takes no more than 30 seconds for a memory to be summoned and most people will nod. In response to the nod, just say, "Good"… "Good"…) In case no memory comes up, which is very common, just create some imaginary place or event…..

Allow this memory to be as real as possible, so real you can almost taste it. Imagine that your are reliving that experience. Go slowly, breathe easily…. Feel the way you did during that experience… Let everything about that experience give you the same pleasure now as it did then…Enjoy the feeling… Breathe evenly and easily…. (Allow this to continue for a minute or so.)

Now let go of the memory, and imagine that you can focus your concentration and attention so that it is like the tip of a blackboard pointer that you can move from place to place inside your head. Let this point of consciousness and focus of attention slowly move and come to rest toward the front of your face, just behind your nose. Then concentrate on the tip of your nose... Keep focussing on the tip of your nose. Imagine the sensation of touching the tip of your nose with your mind… (Allow this to continue for about 30 seconds)

Now elevate this point of consciousness until it comes to rest just behind your eyes. Bear down at that point… When you are bearing down on the point just behind your eyes, gently nod your head (Use the nod response to pace the sequence of the instructions.) In a little while you may experience a pulsing sensation behind your eyes… (Allow this to continue for about 1 minute).

Now raise your point of consciousness even higher until it comes to rest just under your scalp in the middle of your head. Concentrate on that point. Concentrate hard….(Allow for about 90 second.) In a little while you may experience slight tingling sensations. When you feel those sensations, gently nod your head… (When a number of people have nodded continue.)

Now bring your attention to your hands and allow blood to flow into them. Just visualize you heart pumping your blood up to your shoulder, across your shoulders, and then down your arms, past your elbows, down your forearms, past your wrists, and into your hands… Let this flow of warmth into your arms and hands continue…. (Allow this to continue for about 30 seconds.)

Allow your breathing to go slowly and easily. Each time you exhale imagine your breath flowing through your shoulders, down your arms, and out your hands…. Imagine your breath flowing like a gentle warm breeze through your arms as though they were hollow tubes…. As you are breathing allow your exhalation to go slower…. Allow each exhalation to flow through your arms… If your attention wanders that is OK, just gently bring it back to an awareness of feeling the air flow down your arms and out your fingers. As if you can still feel someone stroking down your arms … Continue to allow the air to flow down your arms… (Allow this for about two minutes.) Feel the warmth flowing out through your fingertips…. You may want to repeat to yourself, "My arms are heavy and warm…. My arms are heavy and warm….." Many of you may notice gentle pulsation and tingling in your fingers…. Be aware and feel the sensations while you continue to exhale slowly and allow the air to flow down your arms and out your hands and fingers… (Continue for one minute.)

Now let go of breathing down your arms, become aware of the room, take a deep breath, stretch, open your eyes and look at the temperature of the thermometer held between your thumb and index finger.

5. Record the temperature of the index-thumb finger (Post-measure)

Record this temperature (Post-measure) and optionally fill out the questionnaire to rate your experience of stress level at this moment.

6. Record the participants' temperature data on the black board

Ask the members in audience to raise their hand if their temperature went up. Usually about 90% report an increase in temperature. Tally their findings on the blackboard. Ask, "For whom did the temperature decrease?" Usually a few will report a decrease. Most commonly, the decrease is reported by those who have very cold hands (less than 80 degrees)--they are too chilly to warm up--or those who have very warm hands (greater than 95 degrees)-- they are sitting and relaxing and beginning to reduce their metabolic rate and cool down.

Now do a tally of the observed temperature change of the participants. How many –2 degrees, -1, no change 0 degrees, + 1, 2, 3, …20, 21, etc. As numerous members of the audience report temperature increases of 10 to 20 degrees, a sense of wonder ripples through the audience. All of a sudden, they realized the impossible is possible—for them a shift in beliefs has now occurred. Control over peripheral warmth is possible. At this point they may begin to wonder about other possibilities.

7. Discuss subjective experiences and implications of these experiences

> *"I feel incredibly relaxed right now, and somewhat surprised that I raised my hand temperature 26 degrees"*

Lead a discussion on the factors that are involved in peripheral warming and the implications of this experience. Discuss the concept that many people would have said that they have cold hands because of poor circulation. Yet, if it was poor circulation, how could their hands warm-up? Most likely, they maintained a covert state of chronic arousal by breathing shallowly and thoracically, and remained anxious or worried throughout the day. Remind the audience that the goal is to recall the sense of streaming and hand warming when they practice the Quieting Response as they react to life's compulsory stressors. Discuss the implication of chronic arousal and how hand warming could reduce the risk of illness and promote health.

The practice also calls attention to the fact that awareness and imagery affect peripheral temperature. Explore the implications of the relationship between thinking and body. Namely, be careful what you think and imagine; it may effect your physiology.

One major concept to point out is the Law of Initial Values. That is to say, if your hands are very warm, the increase in temperature is limited to the core temperature. Other important considerations in temperature regulation include:

A. Thermo-regulation (the brain likes to stay at the same temperature). The peripheral blood vessels will constrict to preserve warmth. Hence, one way to warm your hands and feet is to reduce heat loss by wearing a hat (something our grand mothers knew when they wore a nightcap to bed if they had cold feet and could not fall asleep).
B. Chronic arousal and probable thoracic breathing. When relaxation occurred in the guided exercise and the body was attended to passively and without judgment, the blood vessels dilated which allowed more blood to flow through the tissue. This process evokes an anabolic state that facilitates regeneration and healing.
C. Pharmaceutical agents and hormonal processes. Certain chemicals such as caffeine and nicotine induce peripheral vasocontriction (hand cooling) while alcohol induces peripheral vasodilation.

If the participants rated their stress levels before and after the exercise, they would have observed a significant decrease in subjective stress. Discuss the usefulness of using hand warming as a technique to reduce stress.

Research Date: Hand Temperature Changes and Correlation between Change in Temperature and Perceived Stress:

Using the above procedure, we collected data from 219 subjects in different groups: physical therapists in the Netherlands (86 females and 26 males, mean age 39.4 years, SD=8.4) and San Francisco State University Students (81 females and 25 males, mean age 25.4, SD=7.7).

Results:

The average temperature increased 8.1°F (SD= 6.9°F) from 85.3° to 93.4° Fahrenheit during this exercise as shown in Figures 3. In addition, the change in subjective stress level as measured from the university students decreased from 4.3 to 2.2 (on the scale from 0 relaxed to 9 tense) as shown in Figure 4.

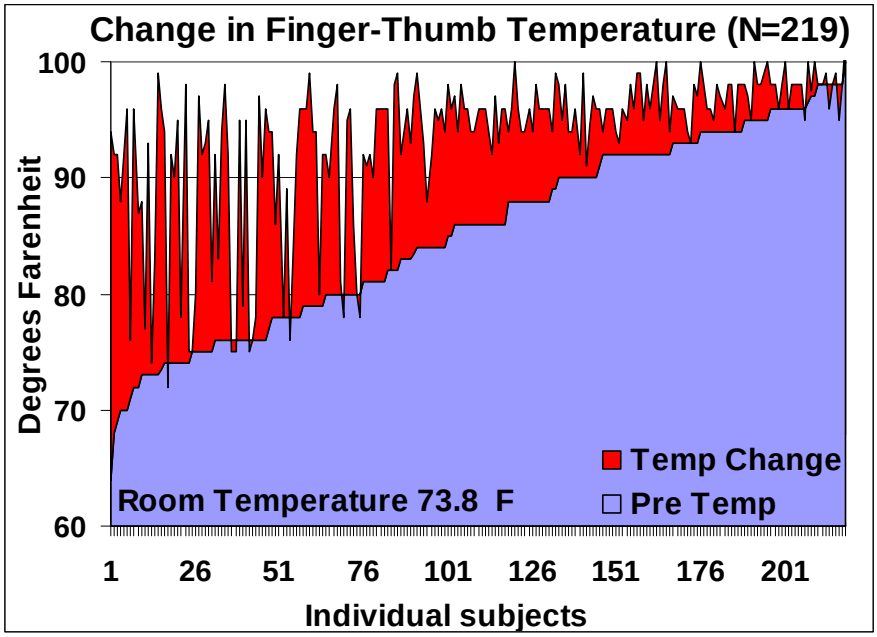

Figure 3. Change in temperature for each individual subject

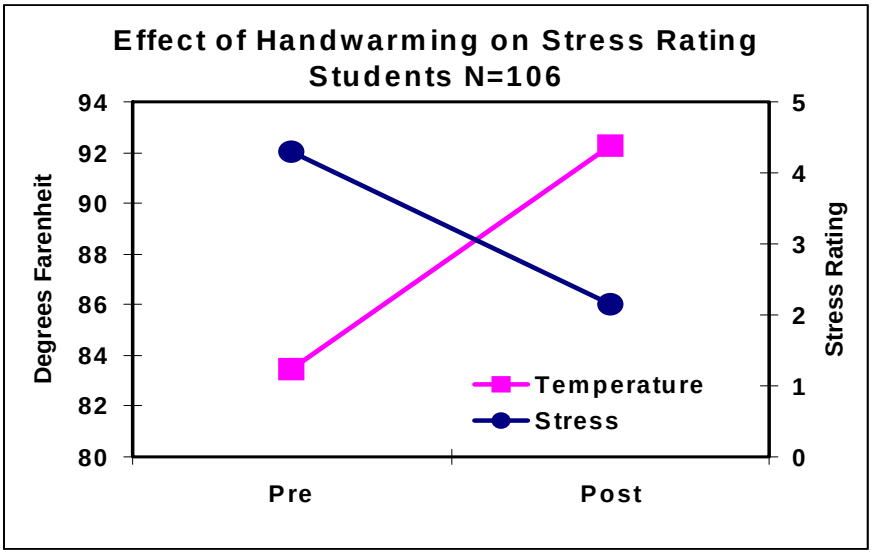

Figure 4. Change in subjective stress rating and peripheral hand warming

There was no significant difference in peripheral hand warming due to gender.

Discussion:
In our experience with thousands of students, workshop and lecture participants the practice works best if the room is not too warm. The data shows that if people have very cold hands then fewer will warm their hands, however, those who do warm will warm them more (law of initial values). If the room is too warm, the hand temperature of the participants is too high and will not increase again due to the Law of Initial Values.

We usually give the workshop/lecture participants the glass thermometer to take home so that they can continue to practice this skill. It also is an advertising tool, since the cardboard is printed with our address. Thus it is a reminder for referrals.

A Lasting Experience:
This detailed guided practice is a pragmatic and successful strategy to evoke peripheral hand warming. It can be done very effectively in different groups of various sizes. The most important experiential value of this practice is that so many people can rapidly warm their hands, thus it facilitates a shift in participants' beliefs that voluntary control is possible. With this change in belief structure, participants understand that they can regain control; there is hope that they can prevent illness and mobilize health.

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