



the extra gear

Mental Toughness Training for Peak Sport Performance

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Intensity Regulation

Introduction

Sometimes we don't have enough intensity during training or a competition – like when we begin to get tired in the middle of a long race or during long training rides. Other times we have too much intensity – like when we feel tense or worried before an important race. When we have too little intensity we can feel bored, our mind wanders, and our motivation diminishes. It also affects us physically – we may become too relaxed and lose power and efficiency. When we have too much intensity we can feel anxious and worried, we might become so preoccupied with our performance that we miss important things happening around us. It also affects us physically – we may become tense and stiff, which also leads to decreased physical performance. This highlights the importance of becoming more aware of your mental state in general and level or intensity in particular. The good news is people can learn how to manage their level of intensity and thereby change it to more closely approximate the ratings you made about your best performance.

The Intensity-Performance Relationship

So, just how intense should you be for optimal sport performance? That depends on many factors, including the nature of the sport (e.g., football players require great amounts intensity in shorts bursts; marathon runners need to manage their energy over a much longer time) and the nature of the individual (e.g., some people function best when they're really revved up; others need to be more relaxed). In general, however, everyone has a middle range of intensity in which they function best. You may have heard of the "inverted-U" curve that depicts the relationship between intensity level and performance. This curve looks something like the infamous "bell curve" some of our teachers used to grade us in school. In this case, however, the curve shows that performance is at its peak when it's neither very high nor very low; somewhere in the middle you'll find your peak performance state.

This intensity-performance relationship has been demonstrated in many research studies for decades, and shows the importance of regulating intensity for peak performance. There are still two problems with this relationship, however: Everyone's "optimal intensity" is not the same. You can see this for yourself before a race. Some people prefer to get "pumped up" while others prefer to be quiet and alone. Secondly, a person's "optimal intensity" depends on the situation. For instance, what do you think your optimal intensity would be at the very start of a 100-mile race compared to the end when you are anticipating a sprint to the finish?

Today we often think about optimal intensity, not as a single value, but as an individually determined range in which each person performs their best. This range can differ from person to person and from situation to situation. This is one dimension of the "zone" that has been called a person's "IZOF," that is, their Individual Zone of Optimal Functioning. How do you find your optimal level of arousal? The best way is by keeping a sport journal. While using a journal is best, you probably already have an intuitive sense of when your intensity needs to be increased or decreased, at least in some situations.

Intensity Regulation Techniques

There are many ways to regulate intensity, but I believe that it is useful to have at least two techniques that are designed to increase it and two that are designed to decrease it. That way, when you need to use them when it counts most (i.e., in a competition), you have a second one to fall back on if the first one fails.

Also keep in mind that the anxiety that people can experience when they get too intense can come in “different flavors.” Although an in-depth discussion of this is beyond the scope of this handout, know that sometimes people feel more worried, ruminative, and get nervous about what might go wrong. This kind of worry that goes on in one’s mind is called “cognitive anxiety.” On the other hand, sometimes people feel more uptight, physically tense, and get headaches or a nervous stomach. This kind of tension that shows up in one’s body is called “somatic anxiety.” As you’ll be able to see in the next section, some of the techniques will focus more on cognitive components, others will focus more on somatic components. Keep in mind, however, that your mind is not entirely separate from your body, so it would be difficult, for example, for a worried mind to exist in a tense body.

Learning Techniques to Decrease Intensity: Breathing Exercises

When we get tense we often change our breathing pattern. Frequently we either hold our breath or have rapid, shallow breathing from the chest. To feel what this is like, shrug your shoulders and notice how your breathing changes. You inhale from the upper chest and your breathing becomes more rapid and shallow. You can, however, easily learn how to breathe to promote relaxation by taking a deep breath that starts at the diaphragm. This technique is called *diaphragmatic breathing*. Here’s how to do it:

- Think of your lungs being divided into three parts. First, inhale through your nose and fill up the bottom part of your lungs by pushing the diaphragm down and pushing the stomach out. Next, fill the middle portion of the lungs by expanding the chest and raising the rib cage. Lastly, fill the top part of the lungs by slightly raising the chest and shoulders.
- Hold this breath for several seconds, and then slowly exhale through the mouth, emptying the lungs from the top down while feeling the tension leave your body along with the expelled air.
- To confirm that you are taking a diaphragmatic breath, put one hand on your stomach and the other on your chest. As you take another deep breath the hand on your stomach should move out while you inhale and in when you exhale while the hand on your chest should move very little.
- Although breathing is second nature, this type of breathing to relax will take some practice. Aim to practice taking this kind of breath about 30 to 40 times each day for a week to learn it before incorporating it into your practices. It may help you remember if you pair this breathing with other frequently occurring things in your day, like looking at your watch.
- A variation on this kind of breathing is called *1:2 breathing*. You inhale as deeply as you can while counting to 4, then exhale while counting to 8. This 1:2 ratio slows down your exhalation and promotes even greater relaxation.

Learning Techniques to Decrease Intensity: Progressive Relaxation

In many sports it's important to conserve all the physical energy possible until you really need it. In addition, for peak performance, one frequently has to learn to how to use some muscles hard while keeping other parts of the body as relaxed as possible (e.g., like cyclists keeping their shoulders and neck loose while using their legs). This "differential relaxation" can be improved through increasing your awareness of what various parts of your body feel like when they are tense or relaxed.

Progressive Relaxation (PR) is a technique in which muscle groups are alternatively tensed then relaxed and leads to a relaxed mind and body as well as the ability to recognize and release unwanted tension in different parts of the body. It is a good technique to use for overall body relaxation or for differential relaxation. You would not want to use it, however, just before a competition, as you would not want to feel lethargic.

At first PR training takes some time – you need to practice the 25-30 minute procedure every day for at least a week or two before moving on to the next phase. The payoff, however, is that you can learn to speed up this process so that you can relax your body very quickly. With some of the newer variations of PR (e.g., Ost, 1988), it is possible to teach people to relax within 20 to 30 seconds.

When practicing PR, schedule the time at least one hour after eating, as the digestive process can inhibit the process. Muscle twitches sometimes occur during PR. This is normal as sometimes the flexor muscles relax before the extensors. Practice PR in a quiet room, free of distractions. Sit down in a comfortable chair with head support or lay down. You should sit up if you find that laying down causes you to fall asleep. Place a pillow or towel under your knees or neck if you are lying down, if this increases your comfort. Keep your legs and arms uncrossed. Wear loosely fitting clothing. Remove hard contacts.

Progressive Relaxation Script

Here is a progressive relaxation script that you can refer to or record and play back to help you go through the procedure:

Sit or lie down in a comfortable position and try to put yourself in a relaxed state. Allow your eyes to close lightly and comfortably. Become aware of how your body feels as you sit or lie down. Notice where your body makes contact with the chair, bed, or floor. Notice how your clothes feel against your skin. Notice the sensations in your muscles, along your skin, in your stomach, and in your lungs as you slowly and easily breathe in and out.

Now take a long, slow, deep breath through your nose, inhaling as much air as you can. Fill your stomach up first, then your chest, then the top of your lungs. Now exhale from the top down, slowly and completely releasing the breath from the top of your lungs, then your chest, and finally your stomach. Feel the tension leaving your body as you exhale, like fog lifting from a meadow on a spring morning.

Now take another deep breath, filling your lungs up from the bottom to the top. Feel your stomach expand first, then the middle of your chest, and finally the top of your chest. Now exhale from the top of your lungs down, letting the air out from the top of your lungs, then your chest, and finally from your stomach. Let all the tension and worry out with the air you exhale. Now continue to breathe easily and normally, letting yourself relax even further. Feel the rhythm of your breathing, like ocean waves breaking on the shore. Feeling more and more deeply relaxed with every breath you take.

Just continue to relax, deeper and deeper, as you listen to what I say. Remember, you don't need to try to relax; just let the relaxation happen. As we progress, try not to move any more than necessary to stay comfortable, and especially try not to move the muscles that you've already relaxed.

As we go through each of the muscle groups, you will first tense the muscles for about 5 seconds and then relax for about 20. Then you will repeat the tension and relaxation a second time. Don't start tensing until I say the word "NOW." Continue to tense the muscles until I say the word "OKAY." When I say, "OKAY" immediately let go of all the tension in the muscles and enjoy the peaceful feeling of relaxation that you'll find spreading into that part of your body.

Right Hand and Lower Arm

We'll begin with tensing the muscles in your right hand and lower arm by making a tight fist and bending your hand back at the wrist. Begin tensing those muscles NOW. Feel the tension in the hand and up to the lower arm [pause for 5 to 7 seconds]. OKAY, relax. Simply let go of the tension and feel those muscles become loose, comfortable and relaxed. Notice and enjoy the difference between tension and the relaxation [pause 20 to 30 seconds].

Make another fist with your right hand NOW [pause 5 to 7 seconds]. OKAY, relax. Just let the relaxation happen by stopping the contraction; don't put out any effort into it. Feel the relaxation gently spreading into your right hand and lower arm, leaving those muscles loose, comfortable, and relaxed [pause 25 to 30 seconds].

Right Upper Arm

Next tense the muscles of your right upper arm by pushing your elbow down against the floor or back of the chair. Start tensing your right arm NOW. Feel the tension in the biceps and triceps without involving the muscles in the lower arm and hand [pause 5 to 7 seconds]. OKAY, release the tension all at once. Just let it happen. Let all the tension go and begin to feel the relaxation spread into your upper arm [pause 20 to 30 seconds].

Now do this again, tense the muscles of your right upper arm by pushing your elbow down against the floor or back of the chair NOW [Pause 5 to 7 seconds]. OKAY, release it. Notice the contrast between the tension and the relaxation. Relaxation is no more than the absence of tension. Enjoy the comfortable, calm feeling of relaxation throughout your entire right arm [pause 20 to 30 seconds].

Left Hand and Lower Arm

This time we will work on the muscles of your left hand and lower arm. Take your left hand and make a tight fist and bend your wrist back NOW. Feel the tension in your left hand and lower arm, but keep the upper arm relaxed [pause 5 to 7 seconds]. OKAY, relax. Just let all the tension drain out. Let those muscles become more and more deeply relaxed [pause 20 to 30 seconds].

Now tense your left hand again by making a tight fist and bending your wrist back NOW. Notice the sensation of tension [pause 5 to 7 seconds]. OKAY, relax. Enjoy the feeling between the tension and the relaxation that is now comfortably spreading through your left hand and lower arm [pause 20 to 30 seconds].

Left Upper Arm

Next, I want you to tighten the upper arm muscles of your left arm by pushing your left elbow down. Begin tensing the muscles NOW. Keep your hand and lower arm relaxed [pause 5 to 7 seconds]. OKAY, relax. Let all the tension go [pause 20 to 30 seconds].

Let's tense the muscles in your left upper arm again. Push down the elbow of your left arm NOW. Feel the tension and discomfort [pause 5 to 7 seconds]. OKAY, relax. Just let all the tension dissolve away. Enjoy the pleasant feelings of relaxation. Notice the calm, comfortable sensations you now have in the muscles of both arms and hands. Perhaps there is a sort of flow of relaxation, a feeling of warmth or even heaviness in the muscles. Notice and enjoy this feeling of relaxation, letting yourself continue to relax deeper and deeper, becoming more and more relaxed [pause 20 to 30 seconds].

Forehead

Next, I want you to turn your attention to the muscles in your face. Tense the muscles in your forehead by raising your eyebrows and wrinkling your forehead. Begin tensing these muscles NOW. Feel the tension in your forehead and scalp [pause for only 3 to 5 second for contractions with these smaller muscle groups]. OKAY, relax and smooth those muscles out. Enjoy the spreading sensation of relaxation across your forehead [pause for 20 to 30 seconds].

Tense those muscles in your forehead by raising your eyebrows again NOW [pause 3 to 5 seconds]. OKAY, relax. Allow your forehead to become smooth again. Let your forehead become as smooth as glass. Feel the pleasant sensation of relaxation spreading across your forehead [pause for 20 to 30 seconds].

Eyes, Lips, Cheeks and Jaw

Next you will tense the muscles around your eyes, cheeks and jaw by squinting your eyes very tightly and at the same time puckering your lips and clenching your teeth. Do not clench your teeth so tightly that it hurts. Begin tensing those muscles NOW. Feel the tension in your face while keeping your forehead relaxed [pause 3 to 5 seconds]. OKAY, relax. Let the tension just melt away and enjoy the comfortable feeling of relaxation that is now spreading from the top of your head to your forehead to your face. Enjoy the contrast between the tension and the relaxation [pause 20 to 30 seconds].

Tense those facial muscles again by tightly squinting your eyes, puckering your lips, and clenching your teeth NOW [pause 3 to 5 seconds]. OKAY, let all that tension go. Completely relax your cheeks, jaw, lips, and eyes. Let your lips part slightly. Feeling more and more deeply relaxed. Just let the relaxation happen. Letting all the muscles of your face become comfortably loose, calm and smooth [pause 20 to 30 seconds].

Neck and Shoulders

Next, tense the muscles in your neck and shoulders by raising your shoulders up as high as you can while pulling your neck down into your shoulders. Begin tensing those muscles NOW. Feel that tension in those muscles. Hold it and study it [pause 5 to 7 seconds]. OKAY, relax. Drop your shoulders back down and feel the relaxation spreading through your neck and shoulders. Just let yourself relax deeper and deeper [pause 20 to 30 seconds].

Tense those muscles again by raising your shoulders and sinking your neck NOW [pause 5 to 7 seconds]. OKAY, relax. Just let go more and more. Enjoy the deepening sensation of relaxation. Remember relaxation is simply the absence of tension [pause for 20 to 30 seconds].

Mid-Section

Next, tighten your stomach as if you were bracing for a punch while simultaneously squeezing your buttocks together. Begin tensing those muscles NOW. You should feel a good deal of tightness and tension in just those muscles [pause 5 to 7 seconds]. OKAY, relax. Release all the tension. Just let it all disappear. Just let it happen. Enjoy the feeling of relaxation that is now spreading into your mid-section [pause 20 to 30 seconds].

Tense those muscles again NOW [pause 5 to 7 seconds]. OKAY, relax. Feel the spreading sensation of relaxation. Just letting yourself go more and more. Feeling more deeply relaxed with every muscle group. Allow yourself to enjoy the peaceful feeling of relaxation throughout your entire upper body. Take a moment to take an inventory of all the muscles you've relaxed so far. As you do so, let your mind send messages to any muscles that experience even a little tension, and let yourself enjoy feeling more and more deeply relaxed. [pause 20 to 30 seconds].

Right Thigh

This time I want you to turn your attention to your right leg. Tighten the muscles in your right thigh by simultaneously contracting all the muscles of your thigh. Tense those muscles NOW. Try to localize the tension only to your thigh, and note the sensations in your right quadricep and hamstring [pause 5 to 7 seconds]. OKAY, relax. Notice the relaxation sensations that are now beginning to spread downward from your upper body to your right thigh. Just let it happen. Remember relaxation is merely the absence of tension; it takes no effort except merely releasing the tension [pause 20 to 30 seconds].

Alright, now let's tighten those same muscles in the right thigh again beginning NOW [pause 5 to 7 seconds]. OKAY, release the tension. Just passively let it evaporate. Enjoy the feeling of your right thigh relaxing, as if you stretched a rubber band and then released all its tension [pause 20 to 30 seconds].

Left Thigh

Next, turn your attention to your left thigh. Tighten the quadriceps and hamstring muscles in your left thigh by simultaneously contracting all those NOW. Notice the sensations of tightness and tension there [pause 5 to 7 seconds]. OKAY, relax. Feel the pleasant, calm, comfortable feeling spreading into your left thigh [pause 20 to 30 seconds].

Alright, now let's tighten those same muscles in the left thigh again beginning NOW. Notice the contrast between the tension and the relaxation [pause 5 to 7 seconds]. OKAY, release all the tension. Just let all the tension go and enjoy the feeling of relaxation. Feeling more and more relaxed now Deeper and deeper. Feeling peaceful, calm, and very, very relaxed [pause 20 to 30 seconds].

Right Lower Leg

Next, I want you to tense the muscles of your lower right leg by flexing your right ankle as though you are trying to touch your toes to your shin. Begin the tension NOW. Feel the tension in your right calf, shin, ankle and foot. Keep you thigh relaxed [pause for 5 to 7 seconds]. OKAY, relax. Simply release the tension; let go of any remaining tension in your right leg. [pause 20 to 30 seconds].

Tense those muscles in your right calf, shin, ankle and foot again NOW [pause 5 to 7 seconds]. OKAY, release all the tension. Experience the pleasant sensation of total relaxation in your right leg. Feeling more and more deeply relaxed, peaceful and calm as we relax every muscle group [pause 20 to 30 seconds].

Left Lower Leg

This time you will flex your left ankle backwards, as if you are trying to touch your toes to your shin. Begin the tension NOW. Feel the tension in your left calf, shin, ankle and foot [pause for 5 to 7 seconds]. OKAY, relax. Let go of all the tension. Notice the relaxation spreading down into your left lower leg [pause 20 to 30 seconds].

Tense those muscles in your right calf, shin, ankle and foot again NOW [pause 5 to 7 seconds]. OKAY, release all the tension. Feeling very relaxed now. Just let all the tension run out of your legs, like water going down a drain [pause 20 to 30 seconds]

Feet

Next I want you to tense only the muscles in both feet by pointing the toes of both your feet downward, while keeping your calves and shins relaxed. Tense those muscles NOW. Note the discomfort in the feet [pause 5 to 7 seconds]. OKAY, relax. Feel the spreading sensation of relaxation as you relax deeper and deeper [pause 20 to 30 seconds].

Now let's point your toes of both feet downward again NOW [pause 5 to 7 seconds]. OKAY, relax. Release all the tension. Let go more and more. Just let yourself relax completely, letting go of all the tension in your body [pause 20 to 30 seconds].

Whole Body

Now I want you to take a brief survey of all the muscles in your body, from your head to your toes. If you notice any tension in any of the muscles, just let it go, and enjoy the peaceful, comfortable feeling of relaxation. Relax all the muscles of your body. Just let them all go limp. Breathe slowly and deeply. Feeling more and more deeply relaxed with every breath you take. Just let every last trace of tension evaporate from your body.

You may notice a sensation of warmth and heaviness throughout your body, as though you are sinking deeper and deeper into the chair or floor; or, you may feel as though you are as light as air, like you are floating on a cloud. Whatever feelings you have, just go with them. Enjoy the sensation of relaxation. Let yourself relax deeper and deeper.

Before opening your eyes, take several deep breaths and feel the energy and alertness falling back into your body. Wiggle your fingers. Stretch your arms and legs if you wish. When you are ready, open your eyes and feel alert, awake, refreshed, but still very relaxed.

Quick Relaxation Techniques

Here are two similar techniques that are short enough that they can be used during a competition. It is advisable that you first learn the full PR procedure before you use these abbreviated techniques.

- A *quick body scan* is a short passive PR technique that can later be incorporated into an athletic performance. It merely consists of quickly scanning the muscles of the body from head to toe (or the reverse), stopping at muscle groups that are too tense, releasing the tension, and continuing the scan.
- A *neck and shoulder scan* follows the same procedure as the quick body scan, but focuses only on the neck and shoulders. Athletes can release the tension by rolling their necks around their shoulders. This can help spread the relaxation to other areas of the body, can relax the mind by giving it a brief break, and is a particularly good tool for cyclists, as unwanted tension frequently builds up in the neck and shoulders.

Learning Techniques to Increase Intensity: Breathing Exercises

While slowing down your breathing can decrease intensity, breathing more rapidly can increase it.

- First, focus on breathing rhythmically, and then speed up your breathing rate. While doing this, imagine that you are inhaling energy and exhaling fatigue. Sometimes it can be helpful to say “energy in, fatigue out” to yourself as you inhale and exhale.
- The combination of narrowed attentional focus, imagery, self-talk and increased breathing rate is a simple, yet effective, way to quickly increase intensity when you need it.

Learning Techniques to Increase Intensity: Imagery and Cue Words

This is really two techniques, but they are both easy to explain and can often be used together, so I'm presenting them as if they are a single technique.

- Think of something that is an energizing image for you. It may be an animal known for speed, like a cheetah. It may be the image of a train relentlessly rolling along the track.
- You may think of several images, each of which most relevant to a particular kind of situation. For example, the cheetah image may seem most energizing in a sprint; for me, the train image seems to work best during a long climb.
- Next, think of some words or phrases that are energizing for you. They may be things like "go," "explode," or "take off." Other words may work better in situations requiring long efforts – I use the word "relentless" along with my train image on climbs on my bike.
- Combine these images and cue words to form pairs that you feel would work best when you need an immediate boost in your intensity (short-term intensity cue-word/image pairs) and others that you feel would work best when you need a more sustained increase in intensity (long-term intensity cue-word/images).
- When you need fast energy, like when you need to respond to an attack, you can use your short-term cue-word/image that stimulates explosive energy. When you are getting fatigued on a long ride and need a more prolonged intense effort, you can use your long-term cue-word/images for more sustained intensity.

For more information on goal-setting and other mental skills techniques to improve sport performance, contact sport psychologist Dana Blackmer, Ph.D. at Dana@TheExtraGear.com or visit The Extra Gear online at www.TheExtraGear.com.