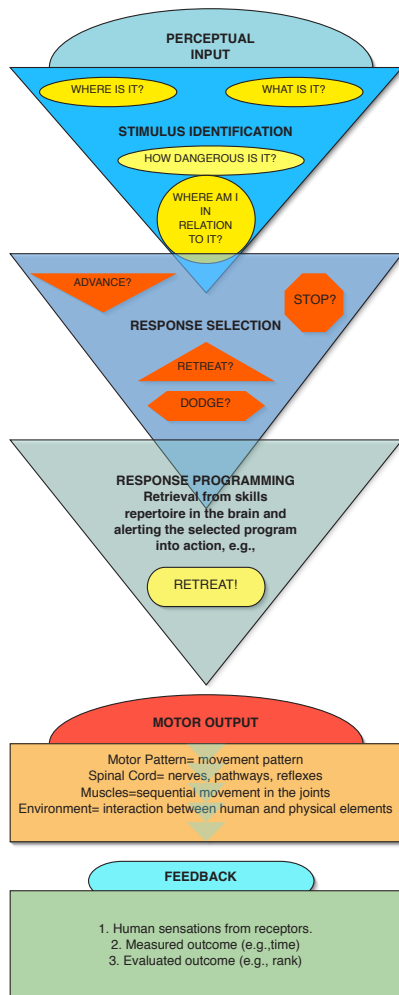


# the **CrossFit** JOURNAL ARTICLES

## Perception

### The Commander of Our Movements

Eva Twardokens



*This article was originally written specifically about the role of perception in alpine skiing. It was written by my father, George Twardokens (“Dr. T.,” as he is known), and was published in the journal Professional Ski Instructors of America. We wanted to bring some new concepts and prescriptions to the CrossFit community to get “black boxed” and refined. This article uses some of the words of my father’s article verbatim and removes most of the skiing specifics to discuss the importance of perception in training for all types of athletes, as well as soldiers, police, firefighters and others who depend on their physical readiness.*

Athletes looking to improve their skills often concentrate on how they move, but they’d be wise to focus also on which movements they select and how quickly they respond. Training to reduce response time through enhanced perception—as if by instinct—can make for better performance on demand.

Perception is a topic that’s generating wide general interest these days. In his bestselling book *Blink: The Power of Thinking Without Thinking*, Malcolm Gladwell examines what happens inside a person’s brain during the nanosecond between when it receives stimuli and then prompts decisions and actions the person isn’t even aware of. Gladwell scrutinizes the way the brain absorbs information immediately and then generates responses that we often consider to be intuition but that, in reality, are part of a complicated process of neural actions and reactions.

“When you walk out into the street and suddenly realize that a truck is bearing down on you, do you have time to think through all your options? Of course not,” he writes. “The only way that human beings could ever have survived as a species for as long as we have is that we’ve developed another kind of decision-making apparatus that’s capable of making very quick judgments based on very little information.”

Gladwell could be describing the skills used in military, LEO, and athletic endeavors. Typical athletes and soldiers don’t perform movements by consciously thinking their way around every obstacle, through every

## Perception... (continued...)

movement, or over every hurdle. Instead, they rely on a combination of sensory input, subsequent motor responses, and learned skills for a safe and hopefully effective performance.

While trainers and coaches have spent decades trying to help students refine their motor responses, it's still standard to talk about the body and the mind as separate entities. For example, most movement analyses consider only the performer's motor output. In reality, however, the majority of skills are composed of a triad of factors—i.e., the individual's sensor-motor-feedback loop.

So what, exactly, is perception? In essence, it's the sensory input identified in the brain as a recognizable impression. It is first step in the acquisition of skills. Perception is critical to the selection of motor response, or the movement component of a skill.

There are three basic stages of perception (figure 1):

- 1.) The identification of the stimulus: What is it?
- 2.) The selection of the response: What to do?
- 3.) The response programming: Get ready; go!

The elements influencing outcomes are:

- 1.) Reaction time (RT): Neural processing of unexpectedly presented stimuli.
- 2.) Movement time (MT): The physical response.
- 3.) Response time (RES): The sum of the reaction time and the movement time.

Deficiency in perception may lead to incorrect selection of the appropriate movement in response. Proficiency in perception is a hallmark of master performers in the fields of MIL/LEO and elite athletics. This group of people can make the appropriate movement choices quickly and accurately, which can be life saving, tactical, or victorious.

Now, the questions are: Can we improve perception? If so, how?

The answer is yes, we can improve perception through training. There are numerous options in how you can train perception, but I suggest keeping it simple.

The best way to begin is to work on some basic movement categories: advancing, stopping, retreating, and dodging. Remember that we are not training the movements themselves here, but the decision of what movement to make and the ability to make that decision and response quickly. Here are a few proposed ways

to start perception training and also incorporate some CrossFit moves.

### Programming

I suggest doing some form of perceptual training once in every three days of training for a total of about two times a week. The session can happen at the end of a workout and the net work time per trainee should be about five to ten minutes.

In the big picture of human performance, perception training is uncharted territory and highly theoretical. So far, we know relatively little about it compared to our knowledge of the motor aspects of training. Remember, there are many skills that are called “habitual skills” (where the environment is fixed, like in typing where the keyboard is always the same, or in a handstand where the floor is level and still.) In these activities, perception is not an important element. But, when you perform what are known as “perceptual skills,” the setting changes constantly (combat, rescue and games), and therefore, accurate perception and response is an essential aspect component. The potential benefits of this sort of training will set CrossFitters yet further ahead of the pack.

**Eva Twardokens** is a two-time Olympian in Alpine Skiing and a 12-year veteran of the U.S. Ski Team. She has won six National Championships, a world Championship bronze medal, and is a World Technical Skiing Champion. She is a passionate surfer, Olympic weightlifter, and longtime CrossFitter. She is a trainer at CrossFit Santa Cruz and at CrossFit seminars everywhere.

Her father, **George Twardokens** (“Dr. T”), is a PSIA-certified Level III alpine skiing instructor at Alpine Meadows, California. A clinician for PSIA-West and a former examiner, he is the author of more than 100 popular and scientific articles on skiing.

## Advance or retreat (muscle ups)

A muscle-up is a three-stage movement in which it is possible to stop the trainee mid-movement and have them make a decision. The three stages consist of the pull, the transition, and the dip. The trainer could have the trainee begin the movement and, at the transition stage, give a signal whether to advance or retreat. Remember, the more simple the signal (such as a thumbs up or down), the better the training, since we want the response to be fast. In the field, the trainee would make the decision whether to advance or retreat based the stimuli perceived in the situation—for example, seeing an advancing opponent, an enemy with a gun, or a room full of fire. The bottom line is that the signal is all about

interpretation, and you don't want to be teaching your trainees how to analytically interpret things, but how to react immediately to the stimulus.

With the muscle-up, unless you are working with a super-advanced athlete (or gymnast), you will probably be working with one rep at a time. Let the trainee rest after each rep of whatever response programming they have performed (continuing or discontinuing the completion of the muscle-up). Five to ten reps should be sufficient to benefit the trainee.



The transition stage, where the signal of thumbs up or thumbs down should be given.



The trainer gives the thumbs up signal and the trainee continues with the dip portion of the movement.



The trainee gets the thumbs down and retreats, letting himself down.

One exercise for perceptual training that Dr. T included in his ski clinics over the years involved planting a pole as a marker on a gentle slope and having skiers assemble about 60 feet above the marker. One person (the "tester") stands about ten feet below the marker, facing the skiers as they descend. Instruct the skiers to descend, one at a time, in a straight run directly toward the marker. As each skier approaches the marker, the tester gives one of three hand signals: to indicate a right turn, a left turn, or a stop. In the initial trial, the tester gives the signal twenty feet before each skier reaches the marker. The degree of difficulty in correctly performing the tester's commands increases with the skier's speed on the descent. You could perform similar exercises in other arenas, off the slopes, as well.



## Dodging (avoiding a person or object)

Dodge ball against a wall or in a circle with a group is a great way to train dodging reactions. I like using this mode because the trainee will have to decide whether to duck, jump, or move laterally away from an object. This is a very pure form of training because all the interpretation and decision-making is totally up to the trainees. They respond instantly, and almost intuitively, to a moving ball, and do not have to determine what a hand signal means or make any other interpretations.

You may do this in timed intervals and have the trainee or trainees dodge for three to five sets of 30-second to 1-minute intervals. Keep them somewhat fresh at first so they have the opportunity to succeed. Don't turn it into a dodge-ball massacre; rather, increase the difficulty and intensity incrementally.



The trainee dodges laterally and down.



Online Video

## Stopping (cleans)

As with the advance/retreat signal for the muscle-up exercise described above, the signal to stop has to be simple for pure perception training. As far as safety is concerned, having a trainer step in front of a trainee or putting an object in front of a trainee moving at high speed can be a disaster for both parties. The clean, however, is a way to train perception and reaction in a power- and speed-oriented movement in a small space and where the movement is vertical, the trainee is in control of the object, and there is a natural stopping point in the movement: the catch, or receiving position, of the clean.

Here is how it should play out: Have the trainee clean a moderate weight at a typical pace for five to ten reps. The trainee should know that you will be giving them a signal to stop at some point in the set, but not on every rep. On randomly selected reps, after the trainee makes the pull, hold out your hand and give the universal palm-forward sign to stop. If the trainee interprets this correctly, they should respond by holding the bottom of the front squat until you put your hand down, at which point they may stand. When you give no signal, the cadence should be natural, with the trainee popping up out of the front-squat position immediately.



The trainee performs a series of cleans, and the trainer randomly stops him at the bottom of the squat and holds him there. When her hand comes down, he stands with the weight and continues his reps.



Online Video

## Advancing (moving toward a person or object)

Advancing toward an object is another basic and universal movement where perception is required. Throw a tennis ball or a light Dynamax ball toward the trainee and instruct them to catch it. Throw high, low, to the left, and to the right. You can also incorporate some squat practice into this by having the low catch at the bottom of the squat, the high catch at a moderate vertical jump for the trainee, and by having the lateral component just far enough away that the trainee will have to move from side to side. The variety of directional movement required to catching the object provides not only good perceptual training but also productive metabolic training and varied muscle recruitment as well. Use the same time intervals and sets as described above for the dodge-ball drills.



*The trainee advances about a step toward the ball. He can also jump or squat to catch it. He returns the ball to the trainer as soon as he catches it, and the trainer throws it back at him in a new direction.*

