Running Head: MENTAL IMAGERY

The Effects of Mental Imagery

On Athletic Performance

Trey Beckerman

Eastern Illinois University
The Effects of Mental Imagery on Athletic Performance

There are two seconds left on the clock, the game is tied and you are the one standing at the free throw line. Make this one free throw and you win the game. The entire gym is going crazy; some are trying to throw you off, while others are cheering for you with all they have. None of that matters. All you are concentrating on is sinking this shot. You may not even realize it, but you may be imagining yourself making it before you even step up to the line. If so, you are using a very popular technique called mental imagery. Practically anyone who has competed in an athletic event has mentally rehearsed one, or multiple actions in preparation of the competition. Mental rehearsal is most effective when paired with a technique called mental imagery.

Mental imagery is the process by which, an athlete visualizes himself or herself performing an upcoming task. There are many names for mental imagery including visualization, mental rehearsal, mental practice, and cognitive enactment (Short, S., Ross-Stewart, L., & Monsma, E., 2006). Each name for mental imagery has its unique style in the way it is used. However, they are all used for the same purpose: to improve the performance of the individual. The use of mental rehearsal and mental imagery by an athlete prior to a competition results in improved performance in the competition. Many experiments in track and field, volleyball, and golf have been done to test this hypothesis.

When an individual first tries to use mental imagery, they must realize that it is a psychological skill that cannot be simply developed overnight. This skill can produce small immediate performance improvements, but for significant improvement, you must practice it often. When the desired results are not achieved right away from using mental
imagery, many athletes will come to the conclusion that it simply does not work. Other athletes may not believe in the power of imagery from the very beginning and therefore will never fully commit to it, resulting in failure to increase performance. Just as a physical skill will not be attained without practice, a mental skill cannot be developed without practice (Van Raalte, J., Brewer, B., 2003).

In general, there are two main theories within sport psychology that explain the relationship between imagery and physical performance: 1) Psychoneuromuscular theory and 2) Symbolic learning theory.

The psychoneuromuscular theory suggests that imagery duplicates the rehearsed motor skill itself, even though the neuromotor activation is of a much, much smaller magnitude compared to the performance of the physical act itself. This is often referred to as muscle memory (Van Raalte et al., 2003). In more simple terms, this suggests that when a person uses mental imagery, the muscles used in the rehearsed action are stimulated at a very low level. This allows for the muscles to “learn” the technique, improving performance when the task is at hand.

In 1983 a meta-analysis of 60 mental practice studies concluded that imagery could possibly result in low-level muscular-impulse activity and that the effects of the imagery itself are more likely to be an operation of the central nervous system rather than muscular activity during the use of imagery (Van Raalte et al., 2003). Because the activation of the muscles occurs at such a low level, it is unlikely that it has any effect on the individual’s ability to perform the task.

The symbolic learning theory suggests that imagery works by allowing the athlete to create a “mental blueprint” to help during performance. This theory is supported by
multiple tests that show that imagery is more effective for tasks that are much more
cognitive-based compared to motor-based. This is most likely a more widely accepted
theory than the psychoneuromuscular theory (Van Raalte et al., 2003).

Many experiments have been done to test the effectiveness of mental imagery and
rehearsal on athletic performance. One such experiment was done with high jumpers
using mental imagery. Over a period of six weeks, one group of active high jumpers
were trained in an internal imagery program for a total of 72 minutes. The second group
also consisted of active high jumpers but instead of being trained in the program, they
simply maintained their normal workout schedule for the same six weeks. The two
groups skill level was kept as even as possible by randomly assigning individuals to each
group. In the experiment there were four measured variables; number of failed attempts,
take-off angle, jumping height, and bar clearance. In the group that was trained in the
imagery program there was noticeable improvement on bar clearance but none for the
control group. The conclusion was made that the use of imagery and imagery training
can be used to improve the performance of a specific motor skill (Olsson, 2008). There is
a chance of slight bias in the conclusion due to the fact that only the bar clearance
measurements improved. However, because those improved by a significant amount, the
conclusion that the mental imagery was the cause of it is most likely correct. In order to
make this experiment more valid, the test could be done multiple times. Research has
also been done in volleyball, where some say that mental strength is equally important as
physical strength.

Another experiment was done on a collegiate volleyball team participating in a
mental skills program for serving. Eleven team members participated in the experiment
with an average age of twenty years (SD=1.1) and an average of 2.6 years of volleyball experience (SD=0.9). Along with mental imagery, relaxation and performance routine were taught as part of the mental skills program. The players used a three-phase service routine in order to increase automaticity of performance. The results at the end of the season found the use of imagery to be significantly correlated with “Good Service Percentage,” (Shoenfelt, E., & Griffith, A., 2008, p. 304). The mean Good Service Percentage for the season was 49% (SD=7). Other results show that the use of the mental skills training program was strongly associated with better service performance (Shoenfelt et al., 2008.). Because the experimental design consisted of two separate groups, it would be difficult for there to be any bias on part of the testers themselves. Because of the fact that there were only 11 athletes in the dependant group, it is difficult for the results to be considered fully reliable. In order to make this specific study more valid the experiment should be done with a much larger group of athletes.

Jack Nicklaus and Hank Aaron are two of the more famous athletes who have publicly claimed using mental imagery to gain success in the sports world. Golf great Jack Nicklaus once said, “A good shot is 50 percent due to the golfer’s mental picture of what the shot should be like” (Jarvis, 1999 p. 81). Nicklaus describes his mental process by saying the following:

I never hit a shot, not even in practice, without having a very sharp, in-focus picture of it in my head. It’s like a color movie. First I ‘see’ the ball where I want it to finish, nice and white and sitting up high on bright green grass. Then the scene quickly changes and I ‘see’ the ball going there: its path, trajectory and shape, even its behavior on landing.
Then there is a sort of a fade-out, and the next scene shows me making the kind of swing that will turn the images into reality” (Sheikh, A., Korn, R., 1994, p. 23).

The game of golf has been proven over and over to be just as much a mental competition as a physical one. The following consists of a few experiments done to test the effectiveness of mental imagery use in the game of golf.

When experiments such as this end with positive results, many golfers get excited thinking that simply by mentally “seeing” themselves hit the perfect shot or make the impossible putt, they can greatly increase their skill and better their score. However, there are some who would strongly argue against it by believing that only top professionals can truly gain from using mental imagery. This next experiment tested the combination of mental imagery and physical practice and how it can improve golfer’s approach shot. The experiment consisted of 23 volunteers ranked as beginners. It consisted of 15 men and 8 women. The average age was 23.4 years (SD=3.7). The participants were placed into 3 groups: 1) Physical practice of approach shot plus mental imagery, 2) Physical practice of shot only, and 3) Engaging in different sports besides physical and mental practice of the shot. The results showed that the shot approach of the beginners improved the most in the group that combined physical practice and mental imagery as opposed to the other two groups (Brouziyne, M., & Molinaro, C., 2005). This experiment suggests that it is possible for beginner golfers to improve from the use of mental imagery. One additional group that could have been made would be a mental imagery only group. This would allow for a comparison to be made directly between physical practice and mental practice. This would greatly help in answering the
hypothesis that the use of mental imagery is helpful for athletes prior to a competition because it would allow for a concrete comparison to be made.

As the use of mental rehearsal and mental imagery has grown more popular, the range of its’ uses has grown as well. It has gone from athletics and competitions to being used in clinical rehabilitation and physical therapy. In the past decade many studies have been done to test the effectiveness of mental imagery and rehearsal on the strength and recovery time of the injured athlete. A study published in January of 2008 was done in order to determine the effect of mental rehearsal versus physical training when recovering from an athletic injury. The subjects were asked to grasp an object and insert it into an adapted slot. They were separated into groups; one group used only physical practice (240 trials), three groups used imagery in different rates of trials (25%, 50%, and 75%) and physical practice, and a fourth group was a control group that used mental rehearsal in 75% of the trials. Movement time (MT) was compared between the first and last trials across all the groups. Each of the groups showed an increase in MT, which would suggest that physical practice was equally as effective as mental practice. However, as more trials were done, the MT of the groups using mental practice to some extent proved to be shorter than the groups with no mental practice. These results suggest that mental rehearsal and mental imagery can be beneficial to physical therapy patients and those in clinical rehabilitation and that it could possibly even replace some of the physical practice associated with rehabilitation (Allami, N., Paulignan, Y., Brovelli, A., & Boussaoud, D., 2008).

If I were to design an experiment that could further test my hypothesis, I would begin by getting 100 individuals to shoot 50 free throws each. And, because mental skills
must be learned just like physical skills, 25 subjects would participate in a mental imagery workshop and practice free throws for five weeks prior to the experiment. Another 25 subjects would only participate in the workshop for five weeks but have no physical practice. 25 more would have only physical practice for five weeks but not attend the workshop. The final 25 would not have physical practice and would not attend the workshop during those five weeks. Because there are four different groups, multiple conclusions could be made from the data and hopefully answer my hypothesis to a great extent. Similar experiments could be replicated in many different sports, with many different athletic tasks.

A major problem for many people using mental imagery is the inability to control the images they see. In order for it to be effective, the content of the images must be fully under the athlete’s control. If the image strays to one that is negative and self-defeating then the imagery use can have a debilitating effect on the performance. The individual must know the extent of control over their mental images they have and practice mental imagery accordingly (Van Raalte et al., 2003 p. 62).

As with many areas of psychology, there is controversy concerning the use and interpretation of mental imagery and rehearsal. As previously mentioned, some believe that not everyone can benefit from the use of mental rehearsal even though some experiments suggest otherwise. This is just one example of controversy over mental imagery. The main area of disagreement would have to be concerning the interpretation of data from experiments designed to test the effectiveness of mental imagery and rehearsal. As with any experiment, there is always a chance for human error to occur in the collection of data. The experiment conductor may overlook an uncontrolled
condition that affects the results, a false correlation may be made, or even a false conclusion can be made. These are only a few of the possible errors that can occur in a mental imagery experiment. They all provide the grounds for a very often debated topic: do positive results for mental imagery occur by chance and how are we able to control the way imagery is used in the test subject. I believe that as more experiments are done, a stronger relationship between mental imagery and better performance will be made. I also believe that we will never be able to fully control the mind of the test subject, leaving the latter questioned unanswered.

As discussed with the previous experiments, mental imagery is very often related with success in athletic performance when used correctly. These experiments have shown the positive results that can be produced by mental imagery. Its use is growing not only in sports, but in the health field as well, and as time continues to pass, new methods of mental practice will be created and the old ones will improve. One point will remain the same: humans will always have a drive to gain an advantage over an opponent. Because of this, the use of mental imagery will be common for a very long time.
References


Story: Led Hell Eastern Illinois University
http://www.eiu.edu/eiu360/story.php?id=154876