Why Visualization Ought to Include More than What We See with Our Eyes

Description

We often hear about athletes' use of mental imagery techniques in preparation for competition (like here). And on the surface, mental practice does seem like a pretty straightforward concept.

But sometimes it's not really clear what "mental practice" ought to look like. Does "imagery" suggest that we should focus all of our attention on just the *images* that represent what we will see when actually playing and performing?

Or does it work better for us to focus more on the physical sensations and muscle movements we experience while playing?

Or should we perhaps be both seeing *and* feeling?

Time for a drive

A team of European researchers recruited 45 participants to participate in a study to see if *combining* different types of imagery would improve performance more than engaging in just one alone.

They suspected that visual imagery would enhance performance more than doing nothing, but that engaging in visual *and* motor imagery would have even greater performance benefits.

So to test out their theory, they decided to use race car driving as a way to compare performance before and after visualization.

Of course, having a group of young male underclassmen race around in high-performance sports cars was evidently not an option, so the researchers put together a driving simulator for the participants to use, complete with a force feedback steering wheel, gear shifter, pedals, and a racing car seat.

Training phase

Each participant then went through a 90-min training session to get comfortable with the driving simulator, by racing on the Suzuka Circuit of the Gran Turismo 5 Prologue game (click here to see what it looks like).

To ensure all the participants were sufficiently-skilled drivers, they had to be able to finish three consecutive laps in under 170 seconds. Plus, their last three laps had to be within 5 seconds of each other (to ensure the participants achieved a level of consistency and performance had "plateaued").

Then, it was time for the experimental phase, and a test of their driving skills.

Experimental phase

Participants completed 5 practice laps on GT5's Eiger Nordwand track (see it here) to get familiar with the course.

Then, they did 5 "real" laps as a test of their baseline level of performance.

Next, it was time for a little bit of visualization. To help, researchers created two different imagery scripts.

One group of participants received the "internal imagery" script – a walk-through of the course, with prompts to help them envision the route and task at hand (e.g. imagining the view changing as they go around a corner).

A second group of participants received the "internal imagery + kinesthetic imagery" script. Essentially the same walk-through of the course as the first group, except with prompts to help participants imagine the physical sensations and muscle movements involved in driving as well.

A third group – the control group – just solved math problems.

Then, as a test of the imagery session's effectiveness, everyone completed 5 laps as a final post-imagery test of their driving skills.

Which group's performance improved the most?

Before imagery, everyone's driving performance was about the same, with no statistically significant differences between the groups' course completion times.

However, after the imagery session, the groups' driving times began to diverge, with the visual+kinesthetic imagery group turning in a faster time (86.36 seconds) than either the internal imagery group (87.57 seconds) or control group (87.83 seconds).

Indeed, the visual+kinesthetic imagery group's performance improved the most from the brief 2-minute imagery session, going from 87.86s before visualization to 86.36s after visualization (an improvement of **1.5 seconds**). The internal imagery group's performances did improve too, but not by as much (88.44s to 87.57s; **an .87 second improvement**).

The control group's performance, of course, changed not at all, staying virtually the same (87.84s during the pre-test to 87.83s post-imagery).

Why is multi-sensory visualization better?

Research on imagery in the cognitive neuroscience literature has found that engaging in different types of imagery cause neural activations in many of the same areas of the brain. But interestingly, each type of imagery also creates activations in some distinct and unique areas too.

So the researchers surmise that a combined approach to visualization could create a “richer cognitive representation” of the performance of a skill, making for a more effective transfer from practice to performance, and ultimately, better real-world results.

Takeaways

Thinking back on times when I’d used mental practice, I don’t know that I ever really emphasized both the visual component and kinesthetic sensations simultaneously. Auditory imagery was certainly always present, but my focus was generally more on the kinesthetic element than the visual component.

And while there may be individual preferences and differences, combining multiple senses does seem like an approach that would make for a more complete and life-like imagery experience.

In addition, though this wasn’t the purpose of the study, the setup and results seem to suggest that engaging in some imagery might not be such a bad way to spend the last few moments before walking out on stage to begin a performance. At least, better than engaging in mental arithmetic, as the folks in the control group did (and probably better than whatever other nightmare scenario is likely to pop into our thoughts too).

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