Research on Imagery and Motor Performance: Three Methodological Suggestions

Neil Wollman
Manchester College

Extensive research has tested the effect of mental rehearsal on sports and other motor skill performance. Feltz and Landers (1983) list approximately 100 studies that have been conducted since the 1930s. Although their meta-analysis of these studies revealed that mental practice "influences performance somewhat better than no practice at all" (p. 41), the effects have been far from consistent. Certainly the results are too inconsistent to reasonably guarantee experimental success in any given motor performance situation. Nor can it be assured that imagery, the mental practice technique of concern here, was the causal factor in any particular real-life anecdotal sport's success.

In order to better identify those factors that mediate or modify imagery's elusive success, three methodological strategies are offered. Two of the three have been suggested by others and have been used to some extent, but they have not been fully explored.

Better Control Groups

First, there is need for a greater variety of control groups across imagery studies. This should be coupled with the use of multiple control groups within individual experiments. This strategy will allow researchers to better isolate those factors within imagery procedures that are necessary and sufficient for motor performance improvement. Control groups are still often limited to those employing physical practice, no practice, or a combination of these with mental practice. In fact, in their review Feltz and Landers (1983) were even able to separate control groups into the three categories of pre-post (22 studies), simple (35 studies), and motivational (often meaning a no-practice group, 34 studies). To date, control groups have not been used in a creative or systematic manner in order to sift out what components of imagery procedures result in what effects (see reviews by Corbin, 1972; Richardson, 1967a; 1967b). The consequence is that factors important to success have not been isolated and purposefully manipulated, and thus many imagery studies have been unsuccessful.

Requests for reprints should be sent to Neil Wollman, Dept. of Psychology, Manchester College, N. Manchester, IN 46962.
Among other possibilities, control groups should isolate the effects of the following components which are overt or covert parts of many imagery routines: the visual or kinesthetic image per se, the cognitive information about proper and successful body movements (e.g., “keep arm bent”) that is formally contained in the experimental procedure (imagery instructions) or is part of subjects’ “self-talk,” the increased motivation typically spurred by visualizing successful movements, and the general body relaxation that imagery concentration often induces. Research should examine these four factors and others, both individually and in combination, to discover the relative importance of each in imagery success. Research should also dissect these factors (e.g., are there certain types or aspects of cognitive information that make for success?).

One example will be given to illustrate how control groups can be used to isolate possible causal factors. In order to separate the effects of the image per se from cognitive information, the following groups might be employed: one that has the experimenter directing subjects to visually and/or kinesthetically experience the body movements of a particular motor task, and another that is told the same information about proper body movements but is to suppress imagery. Though perhaps not feasible, ideally there would be a third group that would visualize body movements but suppress all thoughts about the movements.

Single-Subject Designs

Imagery research would also benefit by complementing traditional group design research with single-subject methodology. I will concentrate here only on the advantages of the latter. Imagery as an independent variable can be introduced over hours, days, or weeks through a standard ABA design (baseline behavioral measure, introduction of independent variable, and removal of independent variable). Also, imagery can be introduced through any of a number of other designs that require no return to baseline performance behavior (e.g., a changing criterion—shaping—design). In exploratory stages of research, the imagery routine can even be modified over time to see differential effects on performance.

There are a number of advantages in using single-subject designs. First, and obviously, the link between imagery and its effects/noneffects on motor performance can more easily be seen. Single-subject designs also allow detection of successful effects for certain individual subjects who otherwise might have their success masked in a nonsignificant group design. Successful individuals/performances can be examined to see what subject characteristics or other factors perhaps led to motor performance improvement. Further single-subject or group design studies can then purposely vary such characteristics or factors hypothesized to be important.

Single-subject methodology may also be better suited than group designs in working with skilled athletes/performers who will not improve much from pretraining level. Small but consistent changes may be seen in a single-subject design but not emerge significantly in a group design.

Finally, experiments with single-subject behavioral monitoring lend themselves well to tailoring specific imagery programs for individuals engaged in real-life athletics. Rather than using one set training program for all athletes, imagery