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FLOTATION REST AND IMAGERY IN THE IMPROVEMENT OF COLLEGIATE BASKETBALL PERFORMANCE [1]

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Summary.—22 expert collegiate basketball players were exposed to either imagery training only or restricted environmental stimulation (REST) with imagery training. The REST group showed significantly better performance on both objective game performance and coaches' blind ratings.

Restricted Environmental Stimulation (REST) enhances mental imagery (A. F. Barabasz, 1982, in press). REST combined with imagery training can produce significant improvements in athletic performance (McAleney, A. F. Barabasz & M. Barabasz, 1990; Lee & Hewitt, 1987). Lee and Hewitt (1987) employed multiple REST sessions with novice and intermediate competitive gymnasts and found improvement on the basis of judges' ratings of performance. Only one controlled investigation of improved athletic performance by REST has been completed with expert players, these being tennis players studied by McAleney, A. F. Barabasz, and M. Barabasz (1990) who reported significant improvement in first service winners in actual intercollegiate competition. Now, the present study focused on expert collegiate basketball players to provide a test of the effects of REST and imagery on both objective and subjective measures of performance.

METHOD

Subjects

Male basketball players ($N = 22$) from two major university varsity teams volunteered for a study of "mental imagery and sports performance" during the 1988-89 basketball season. Coaches for each team agreed to allow solicitation of subjects. All but one player from each team volunteered. Subjects from each team were assigned to a random ordered sequence of either REST plus imagery ($n = 11$) or imagery only ($n = 11$) conditions.

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Measures

Detailed information on all measures appears elsewhere (Wagaman, 1990). Briefly, performance (PERF) scores are objective measures based on collegiate or professional basketball game performance statistics. Concurrent validity coefficients range from .73 to .83. The PERF score is derived from Sonstroem and Bernardo's (1982) formula which, for example, would score a plus point for successful shooting or passing and a minus point for a foul or traveling. To provide a plateau for performance aggregated PERF scores were calculated for each player over 11 games prior to beginning the study and over the five games immediately after completion of treatment. The Performance Evaluation Questionnaire is a standardized coaches' report form (AAHPERD, 1984) which was filled out pre- and posttreatment by coaches who were blind to subjects' group assignment. The Performance Questionnaire (Stanley, *et al.*, 1987) is a short self-report measure of subjects' perceptions of treatment effects on their basketball performance. These data were obtained within five days of completion of all treatment sessions.

Imagery Training

The Lee and Hewitt (1987) tape of enhancement of athletic performance was adapted for use with basketball players by substituting for gymnastic imagery visualization in successful game performance of shooting, dribbling, and passing. The 20-min. audiotape emphasized relaxation and visualization of skills in competition. A transcript of the tape is given by Wagaman (1990).

Treatment Environments

REST subjects floated supine on a 20% solution of water and epsom salts at about 34.2°C in a light-proof, sound-attenuating fiberglass tank. As in the McAleney, *et al.* (1990) study, an intercommunication system integral to the Flotarium tank facilitated transmission of the imagery tape.

Imagery-only subjects sat in a comfortable chair in a lighted office. No attempt was made to attenuate normal ambient sound levels. These subjects were free to study or simply to sit comfortably before and after the tape was played.

After collection of all pretreatment performance measures, subjects were exposed to the above conditions for six sessions over a 5-wk. period. Consistent with arrangements described by McAleney, *et al.* (1990), the imagery tape was played at the 30-min. point of each session.

RESULTS

Details of analyses are reported by Wagaman (1990). Briefly, a split-plot analysis of variance on PERF scores from pre- and posttreatment games for both groups showed a significant interaction (pre-post × treatment) ($F_{2,49}$ =

3.69, $p < .05$). A Scheffé test showed the REST group ($M = 15.8$, $SD = 3.6$) scored significantly ($p < .01$) higher than the imagery-only group ($M = 11.2$, $SD = 2.7$). A Scheffé test contrasting scores for the five subjects who completed two REST sessions between games with those for six subjects completing only one session between games was also significant ($p < .05$). Subjects exposed to two REST sessions between games showed higher PERF scores ($M = 26.0$, $SD = 13.0$) than subjects who experienced REST only once between games ($M = 15.8$, $SD = 3.6$). The baseline pretreatment PERF scores were not significantly different between groups ($F = .41$, $p > .05$).

A Kruskall-Wallis one-way analysis of variance was calculated on coaches' blind rankings of players immediately after each of the 11 pretreatment games and immediately after each of the five posttreatment games. The REST subjects were rated as significantly ($p < .05$) better than the Imagery-only subjects on passing (REST M rank = 4.9, Imagery-only M rank = 6.8) and shooting (REST M rank = 5.0, Imagery-only $M = 7.0$) but not on dribbling, defense, or over-all skill.

A one-way analysis of variance of subjects' ratings of treatment effectiveness (Performance Questionnaire scores) showed no significant ($p > .05$) difference between the REST group ($M = 29.7$, $SD = 4.2$) and the Imagery-only group ($M = 30.7$, $SD = 3.9$).

Discussion

The present study was the first to show significant effects of REST for intercollegiate varsity basketball players. The findings confirm that flotation REST, with taped imagery, produces better performance than the same imagery training without REST. The REST-imagery group's performance was better than that of the Imagery-only group on both objective game performance scores and coaches' blind ratings of passing and shooting. REST appears to increase the effectiveness of imagery training. The potential contribution of expectancy to these results appears to be limited since subjects' ratings of perceived effectiveness showed only neutral to a slight effect and no significant difference between REST and the Imagery-only group. Further research, employing a suitably large N and several teams, should address the issue of REST effects and specificity of imagery according to the various positions played.

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