Experimenter Naivete and Imagery Practice

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The effects of imagery practice on motor skill acquisition have been examined for over 50 years (Sackett, 1935) under many labels. Mental practice (Corbin, 1967), mental rehearsal (Yamamoto & Inomata, 1982), mental training (Ulich, 1967), and visuo-motor behavior rehearsal (Noel, 1980) have all been employed to describe basically the same process. Equally varied have been the motor tasks utilized in research. Familiar motor tasks such as the basketball free throw (Eideness, 1965), volleyball serve (Shick, 1970) and tennis forehand (Surburg, 1968), as well as novel tasks such as target tracking (Kohl & Roenker, 1983), have been incorporated into imagery research.

Intons-Peterson (1983) conducted a series of studies involving imaginal or perceived judgments to determine if imagery paradigms are influenced by experimenter expectation. The results of these studies, as well as those of earlier work (Intons-Peterson & White, 1981), substantiated the hypothesis that an experimenter knowledgeable of the paradigm could introduce unconscious bias into an imagery study. Tacit cues such as voice inflections, meaningful pauses, and certain verbal and nonverbal feedback (i.e., demand characteristics) can be given by the experimenter.

The results of these studies raise questions regarding the findings of imagery research involving motor tasks. First, has imagery/motor skill research been conducted in such a manner that bias of this type may have been introduced? Second, are imagery/motor skill studies as sensitive to these biases as were the perceived judgments of Intons-Peterson’s (1983) research?

A perusal of imagery/motor skill research revealed the utilization of various instructional conditions and practice sessions. For example, taped instructions were provided by Harris and Robinson (1986), task information and demonstrations were provided by Ryan and Simons (1982), and written instructions were used by Epstein (1980). Some of these procedures were apparently done with experienced researchers and with a protocol that could have introduced an unconscious bias. Intons-Peterson (1983) concluded that naive experimenters were required when conducting experiments involving imaginal or perceived judgments (i.e., single-blind protocols). Rosenthal (1966) identified a similar effect pertaining to experimenter expectancy. Martens (1970), however, concluded that experi-
Experimenter expectancy may not influence psychomotor performance to the extent that it does cognitive and affective variables. The question arises as to the need for naive experimenters in imagery/motor skill studies.

The first stage of learning has been described by Fitts and Posner (1967) as the cognitive stage. This phase may be more sensitive to experimenter bias, for subjects are integrating into their thought processes different information and cues. Fleishman and Hempel (1954) demonstrated the changing role of different perceptual motor components during motor skill acquisition. For example, visualization was shown to have a greater role during the early stage of skill acquisition. Based on this conclusion, it is possible that experimenter bias may influence both the imagery component and the early physical practice phases. An alternative hypothesis is that this bias effect is cumulative and emerges during later stages of skill acquisition. The primary purpose of this study was to determine the effect of experienced and naive experimenters on the outcome of an imagery/motor skill acquisition experiment. If applicable, a second purpose was to determine the stage or stages during skill acquisition in which bias effects are most salient.

Method

Subjects

Subjects were 80 college-age students ($M = 20.1$ years) at Indiana University. Forty-two females and 38 males were randomly assigned to one of four conditions.

Apparatus

A photoelectric pursuit rotor (Lafayette Model No. 30014) with a circular template was used for the criterion task. Target velocity was set at 45 RPM, and an electronic chronoscope recorded the subject's time on target for each trial. Between each testing session, the velocity of the pursuit rotor was calibrated. A multitask reaction-time apparatus (Lafayette Model No. 6314) involving key pressing was used for the placebo group.

Procedures

All testing was done with only the subject and an experimenter present and with time on target serving as the dependent variable. Table 1 provides a summary of the procedures followed in all conditions. A 30-second rest period with an oral recitation of a list of colors was interpolated between the 15 trials of practice.

The only difference between the two experimental groups was the experience of the experimenter and knowledge of the experimental hypothesis. The experimenter in the naive-experimenter group was not aware of the study's hypothesis and had never taken part in an imagery study. This individual was trained in data recording, timing, performance task execution, and the extent to which questions about the study could be answered without being assessed as a knowledgeable experimenter. A script based on the protocol of Kohl and Roenker (1983) was used in both conditions. An experimenter who had conducted several imagery studies was used to provide instructions to the experienced-researcher group. In lieu of imagery practice, subjects in the placebo and control groups