The interaction of observational learning with overt practice: effects on motor skill learning

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Abstract

This study explored various methods of combining observational learning via demonstration with the effects of overt practice for learning a discrete action pattern. Three groups were compared that varied by the timing of demonstration in relation to practice. An all-pre-practice demonstration group viewed 10 pre-practice videotape demonstrations of an expert performing the skill, and then engaged in practice. An interspersed demonstration group viewed one pre-practice demonstration, then initiated practice on the skill. Every three attempts, practice was halted while participants viewed another demonstration, with this pattern repeated throughout acquisition. A combination demonstration group experienced elements of each schedule by viewing five demonstrations prior to practice, then five more once practice had begun (one every three attempts) so that modeling was completed by mid-acquisition. Ratings of form and accuracy were assessed in an acquisition phase, an immediate retention test, and a 48-h retention test. Group main effects for form scores were detected in acquisition, immediate, and 48-h retention, with the combination group obtaining the highest form scores, followed by the all-pre-practice group, and finally the interspersed group. These findings suggest that several modeling exposures before practice and several more exposures in the early stages of practice were optimal for acquisition and retention of form. © 2000 Elsevier Science B.V. All rights reserved.

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1. Introduction

When the nature of an action pattern is such that instruction focuses on developing a single recommended movement pattern, learning is often stimulated by providing the learner with demonstrations from a skilled model performing the movement pattern. The principal theoretical influence of modeling is to leave the learner with a conception of the way a skill is to be performed, which can serve as a guide for action (Bandura, 1986). In this way, the learner is spared from creating a cognitive conception of the action pattern gradually as a result of trial-and-error experiences. Thus, modeling can serve to increase the efficiency of skill acquisition.

A popular theoretical account of the cognitive mechanisms underlying observational learning presumes that vicarious observational experiences can initiate formation of a cognitive representation in memory that can be enacted and refined during overt practice (Bandura, 1986). According to Bandura, the observer must experience four constituent subprocesses as a result of modeling for observational learning to be successful. The learner must: selectively attend to relevant information in the demonstration (attention subprocess), retain the relevant information (retention subprocess) for eventual imitation, have the capability for using the relevant information for imitation (production subprocess), and have the desire to imitate the modeled action (motivation subprocess). Several techniques are commonly employed to assist the learner in experiencing each subprocess so that information present in a demonstration is consolidated into a memory representation. For example, the use of multiple demonstrations provides repeated exposure to the goal performance in an effort to assist the attention and retention subprocesses. Another technique involves the use of performance cues provided verbally in conjunction with the demonstration to guide the learner's attention to task-relevant cues present in the demonstration on the assumption that the learner will display elements of these cues in overt performance. Both the use of multiple demonstrations and verbal cues have been shown to enhance performance following demonstration (Carroll & Bandura, 1990; Feltz, 1982; Magill, 1993; Weeks & Choi, 1992; Weiss & Klint, 1987; Wiese-Bjornstal & Weiss, 1992).

Another factor which may potentially influence the observational learning subprocesses is the timing of the demonstration in relation to overt practice. Arguably, the most common time that a learner is exposed to a demonstration of a goal movement pattern is prior to overt practice. A presumed advantage of this method would be that observational experiences would allow consolidation of as much information as possible into a preliminary memory representation before enactment. An alternate method of combining demonstration and overt practice involves interspersing demonstrations throughout the practice sequence. This method would presumably allow an assimilation of information into the representation as practice and demonstration progressed, so that observational learning would interact with overt practice. In this manner, the trial-and-error learning process in overt practice would be augmented by frequent opportunities to reinforce the representation for the movement pattern with observational experiences.