AUGMENTED AUDITORY FEEDBACK AND SKILL ACQUISITION IN TARGET SHOOTING
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In this study, a feedback intervention was designed to investigate the effects of augmented auditory feedback on skill acquisition in rifle shooting. The treatment was carried out supplementing intrinsic information sources and outcome information with additional feedback on rifle stability. This was done by delivering a continuous auditory signal concurrently with the aiming phase, indicating how close the aiming mark was to the centre of the target. The effectiveness of treatment was determined in terms of shooting scores.

The participants for the study were 30 male conscripts (age: mean= 19.4 yrs, SD= 1.1 yrs). They were randomly assigned to four groups: auditory feedback group (AFB), knowledge of results group (KR), intrinsic feedback group (IFB), and a non-training control group (CONTROL). Each of the three training groups underwent a 4-week acquisition phase, which consisted of 12 practice sessions. In each 30-minute session the participants shot 40 shooting trials in the standing position on an indoor 10 m shooting range. The target rifle was SAKO 7.62 assault rifle. Shooting performance was measured and recorded with Noptel ST-2000 optoelectronic system. The system displayed the outcome information on a PC monitor. The on-target trajectory of the alignment of the rifle was accompanied by an auditory sound that varied with the location of the aiming mark on the target area. During the acquisition phase, the AFB group received every-trial outcome information supplemented with concurrent auditory feedback. The KR group received every-trial outcome information only. The IFB group was not given any outcome information or auditory feedback. The CONTROL group did not participate in the acquisition phase at all. All participants were given a no-feedback shooting test before the acquisition (pretest) and seven days after the acquisition (retention test).

Analysis of covariance (ANCOVA) procedure with retention test as the dependent variable was conducted. The pretest shooting score served as the covariate and experimental group (1-4) as the independent variable. The group means differed statistically significantly, F(3,35)= 15.93, p=.000. The Student Newman-Keuls post hoc test indicated that the CONTROL group differed statistically significantly (p< .01) from the other three groups, which did not differ from each other. The effect sizes concerning the learning effects for AFB, KR, IFB, and CONTROL groups were 1.51, 0.95, 1.18, and -0.12, respectively.

The data suggested, that the participants who had received additional auditory feedback on their rifle balancing, improved their shooting performance to a greater extent in the retention test relative to the participants who received outcome feedback only or no feedback at all. Given that the differences between the training groups just failed to reach statistical significance, additional empirical research is needed to determine the beneficial role of auditory feed-