Simulated Pistol Training: The Future of Law Enforcement Training?

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Photo of 12 of 16 lanes of fire with cadets training in the simulated range

Introduction

Law enforcement officers have many tools at their disposal, whether it is a flashlight, OC-spray, their verbal communication skills, or their pistol. While these tools are all necessities for any police officer, they are not just given to a police officer without first being given extensive and formalized training on how and when to use each specific tool. Over time technological advances have improved the effectiveness of many of these tools (e.g., revolver vs. pistol), while other tools have seen subtle changes over time. One of the most significant advancements in the area of police training has been the development of simulation technology as an instructional tool; however, adoption of this technology has been slow. In an effort to determine the efficacy of simulation training the Royal Canadian Mounted Police (RCMP) began a series of research studies designed to measure how they could use a simulated firearms range environment as a training tool. The following paper describes the outcomes of these studies.

In 2008 we began the first of several studies designed to determine if pistol shooting skills could be acquired in the simulated environment; however, we also investigated whether these skills could be acquired in the absence of both live-fire and recoil training, and the extent that these skills were transferable to a real-world setting. Typically pistol training occurs with the cadet shooting a specific number of rounds at a target placed a set distance away (3 - 25 m, depending on the stage), and for the vast majority of police organizations, their recruits are also trained in a similar fashion.

Pilot Study

Before we began our research to see if simulation training could replace live-fire training, we decided to first conduct a pilot study with University of Regina, Police Studies students (MacLennan & Partyka, 2009). We chose this route because there was no empirical evidence to suggest that this type of training was effective, and as such did not want to risk RCMP cadets from this unknown method of instruction. However, at the conclusion of the pilot study we determined that pistol training can be conducted in a simulated range environment and that live-fire and recoil are not necessary to learn how to accurately shoot a pistol. In fact, training in this environment transfers directly to performance in a live-fire environment. The results of this pilot study laid the foundation for the next two studies.

Materials

In order to become a regular member in the RCMP, each cadet is required to successfully complete an intensive 24-week training prog ram, with pistol training occurring over eighteen-50 min sessions. Although this training traditionally occurs entirely on a live-fire range, these cadets would receive all of their pistol training in a synthetic range environment, shooting live rounds only during the three evaluation sessions (i.e., Benchmark 1, Benchmark 2, and Final Qualification). The pistol training was identical in every respect to live-fire training; however, they did all of their training with dry-fire laser-based pistols. The training system we used was the Advanced Interactive Systems PRISim trainer (AIS, 2010), who modified their existing software to recreate our RCMP pistol COF. The computerized system projects a digital 25 m range

Photo of 4 lanes of fire in
the simulated range environment

complete with 16 lanes of fire (Illustration 1 and 2). Photos of our firearms range were taken and digitized to replicate, as close as possible, what the cadet would see if they were on the 25 m live-fire range at the academy (e.g., target carrier system, lighting, shadows, etc.). The targets used were jpeg images that were digitized to resemble the targets cadets use in training, but were resized to represent how they would appear when placed at distances of 3, 5, 7, 15 or 25 m. We used our standard Smith & Wesson model 5946 but modified it to emit a laser beam (e.g., all pistols were dry-fire weapons only). We also treated the simulated environment as if it was a live-fire range and adhered to all safety protocols including requiring the cadets to wear their duty belt, ear and eye protection, as well as body armor.

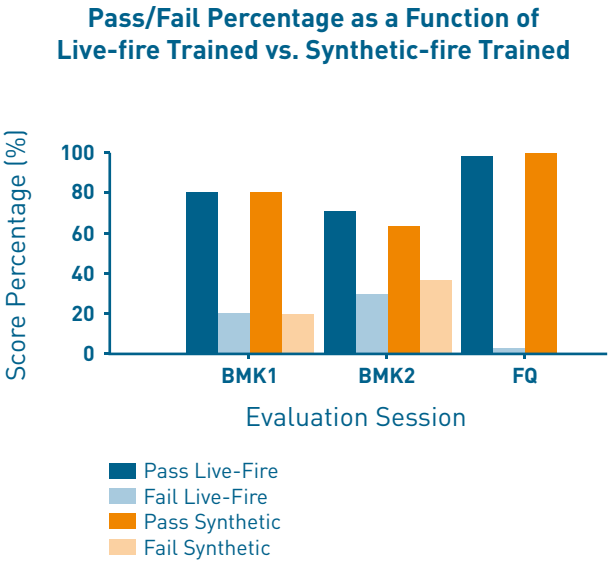

Figure 1. Note.
BMK1 = Benchmark 1, BMK2 = Benchmark 2,
FQ = Final Qualification

Participants and Results

In order to measure the effectiveness of this type of training we compared their performance to three live-fire trained troops (Control) of cadets (N = 96) who were training at about the same time as the simulated trained troop of cadets (Experimental). Using the X2 statistic we calculated both the pass/fail rates between the two groups. To analyze the scores we conducted repeated measures ANOVA across the three evaluation sessions. There were no pass/fail differences observed between the two groups for Benchmark 1 and 2 and the Final Qualification, with 100% of the cadets in the experimental group passing their final qualification test (Figure 1). We also measured scores between the two groups (Control vs. Experimental). As evidenced with the pass/fail rates between the two groups, there were no score differences found (Figure 2).

Although the results of this study provided conclusive evidence that pistol training can be completed in a simulated range environment, and that these skills can be acquired in the absence of live-fire using only dry-fire laser-based pistols, we had two questions that remained unanswered. The first question centered on the first benchmark test. Cadets began their pistol training in the simulated range environment, and the first time they were exposed to live-fire was during their first benchmark test. Although we were encouraged with their results, we posited that if cadets were exposed to live-fire training before each of their benchmark tests, that this would increase the pass rate as well as increase scores. We had assumed that the unfamiliarity of the percussion blast and the recoil of the pistol may have «surprised» some cadets, eroding their confidence in their skills. The second question we had could not be answered for at least one year and will be discussed in turn. Even though we had determined that cadets could learn to shoot in this environment, we were unsure as to the effects of this training after a year. As for all RCMP officers, they are required to demonstrate annually that they can pass the pistol course-of-fire.

We had decided to answer the first question, rather than wait a year to measure the retention of the pistol skills of the first experiment troop. Using a second troop of cadets we trained them in an identical manner as we did with the first experimental troop with one exception. In the training session immediately before their three benchmark tests, we had the cadets complete their pistol training in a live-fire environment. We hypothesized that if cadets were exposed to the recoil, and percussion blast before their benchmark tests that they would be better prepared for these tests thereby improving the pass rates and overall scores. Following the

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Percentage Score as a Function of Evaluation Session and Training Type

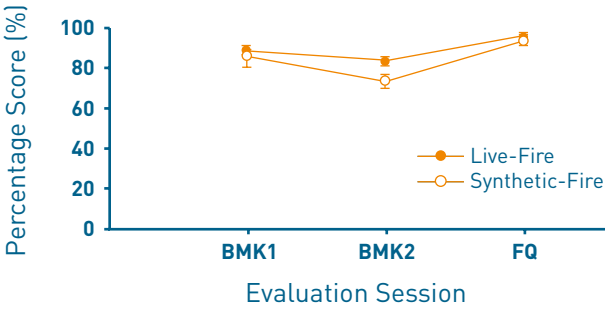

Figure 2. Figure 1. Note. BMK1 = Benchmark 1, BMK2 = Benchmark 2, FQ = Final Qualification

conclusion of their training we found their results mirrored those that were found in the first study. As with the first troop 100% of the cadets passed their pistol course-of-fire, and no score differences were found. In fact being exposed to live-fire before each of the benchmark tests had not positive or negative effects on overall performance.

The second question was answered shortly after the conclusion of the second troop experiment. We collected all the requalification scores for both the experimental and control troops, and we discovered an interesting result. Historically when cadets leave the training academy for the field, we find that pistol requalification scores decrease in each of the two years following graduation. When we looked at the scores for the control troops we found that their scores also were lower than their scores achieved in the training academy. However, when the scores for the experimental troop were examined we found that they not only maintained their skills, but in

Cadet and Annual Qualification Scores

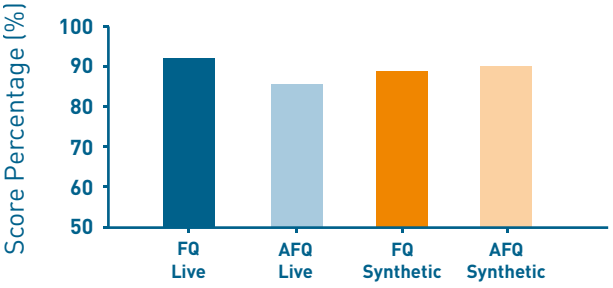

Figure 3. Note. FQ Live = Final score if trained in a live-fire environment, AFQ Live = Requalification score if trained in the live-fire environment 1 year after leaving the academy, FQ Synthetic = Final score if trained in a simulated range environment, AFQ Synthetic = Requalification score if trained in the simulated range environment 1 year after leaving the academy

fact their scores were nominally higher than their training academy scores (Figure 3). Although it is unclear at this point to the reason why, it is possible that the increased number of trigger pulls for those cadets who were trained in the simulated range environment further strengthened their muscle memory. A second hypothesis is that training in a dry-fire environment allowed the cadet and instructor to focus on the skill itself (e.g., trigger control, sight alignment, and grip) instead of having to worry about the recoil and the associated psychological implications. Planned follow-up studies will examine this issue.

Discussion

The evidence is clear that this technology has proven to be a safe and reliable way in which to train cadets how to acquire their pistol shooting skills. However, the lack of scientific evidence required us to begin these research projects that would provide information which would be defendable if and when the technology was integrated into the cadet training program. Our results were further strengthened when researchers at the Federal Law Enforcement Training Centre (FLETC) in the United States (Glynco Georgia), replicated our experiment and found similar results.

The studies discussed in this paper revealed that a police officer can acquire all of their pistol skills in the absence of live-fire using only dry-fire pistols, that the skills are transferable to a real world setting, and that the skills are better maintained than their live-fire trained peers. It is also important to note that these studies examined only the acquisition and retention of the skill, and did not look at the decision making process (i.e., when and if to shoot). Although we are not trying to replace live-fire, we are looking for opportunities to train police officers in a more dynamic setting. One of our long term projects is to develop a course for the simulated firearms range that would require the cadet to shoot from a variety of positions, as well as shoot at moving targets while the target is shooting back. This is not a training option that is currently available due to safety reasons. It is believed that this type of high intensity training will better prepare our police officers if they should ever find themselves in a deadly use-of-force encounter. ■

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