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Strengths and Challenges of Virtual Reality Training for Operational Police Practice

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Source Article

Kleygrewe, L., Hutter, R. V., Koedijk, M., & Oudejans, R. R. (2024). Virtual reality training for police officers: A comparison of training responses in VR and real-life training. *Police Practice and Research*, 25(1), 18-37. <https://doi.org/10.1080/15614263.2023.2176307>

Take Home Messages

- Virtual Reality (VR) training has distinct characteristics compared to real-life training. While VR offers flexible scenario design and fast repetitions of scenarios, real-life training allows for higher levels of physical training activity (i.e., running, quick movements).
- Police officers experience similar psychological stress responses in real-life and VR training, which makes VR a suitable tool to use for the training of psychologically demanding tasks (e.g., room clearance scenarios, domestic disputes, etc.).
- When training in VR, police officers invest more mental effort than during real-life training. To train effectively in VR, the training design should include a sufficient familiarization period where officers can explore the VR tools and the virtual environment before starting the VR training scenarios.

Strengths and Challenges of Virtual Reality Training for Operational Police Practice

Why did the researchers conduct the study?

Virtual Reality (VR) is becoming an increasingly popular tool to support operational training in policing. In VR, police trainers can simulate an unlimited range of environments, starting from basic room clearance scenarios to domestic violence cases up to large-scale school shootings. Compared to real-life scenario-based training, VR training offers flexibility in training locations, instant repetition of scenarios, and technology-enhanced tools that support the training debrief with objective performance feedback.¹

But how effective is VR training compared to real-life scenario-based training in enhancing learning and performance? Research in the field of VR for policing has shown that simulated environments in the form of realistic operational scenarios are able to elicit high levels of stress in police officers.² Similarly, VR appears to be an effective tool for training police-specific knowledge such as large-scale training exercises for mass casualties.³ However, it is still unclear how police officers respond to VR training physically and psychologically, and what the implications of these responses are for the use of VR as part of a police training curriculum.

In the source article, the authors collaborated with the Dutch National Police and measured police officers' physical and psychological training responses to VR and real-life scenario-based training. The goal of the research was to identify differences in police officers' training responses to VR training and real-life training in order to explore how, and for which training topics, VR training is useful.

How did the researchers conduct the study?

In collaboration with the Dutch National Police, the researchers conducted a study around the annual training days of the special intervention unit (i.e., personal protection unit). The police

officers who participated took part in a real-life scenario-based training session and a VR training session. The VR training system was provided by RE-liON (re-lion.com) and consisted of an immersive, full-body tracking, multi-user system (see image above). Both training sessions were designed around a large building where the officers were tasked with surveillance and spotting of suspicious behaviours.

During both training sessions, the police officers wore a heart rate chest strap with an integrated activity tracker to measure their physical training responses such as heart rate and activity level. After the officers finished the VR and real-life training, they filled in a scale to rate their perceived level of stress during the training and the mental effort that they exerted in order to measure their psychological training responses.

After the VR training, police officers also rated their experiences in VR. Specifically, the officers rated their "sense of presence," the feeling of truly being there in the virtual environment.⁴ This information was used as an indication of how police officers experienced the VR training from a technological immersion perspective.

What did the researchers find?

The findings from the source article highlight that police officers have different training responses to VR and real-life training. In real-life training, police officers have higher maximum heart rates and are more physically active compared to VR training. This finding indicates that when a training objective includes the need for physical activity, VR training may not be the most suitable training tool.

On the other hand, the average heart rate of police officers and their perceived stress were similar across VR and real-life training. This is a promising finding as this indicates that VR training is able to elicit similar levels of

psychological engagement. Given the benefits of VR, such as flexibility in location and scenario design, as well as enhanced safety, VR can be used as a suitable tool for the training of psychologically demanding tasks such as room-clearing procedures or domestic disputes.

Interestingly, police officers exerted more mental effort in VR compared to real-life training. This finding seems to indicate that VR training, particularly engaging with a virtual environment, may place additional cognitive demands on the trainee. When looking at the characteristics of police officers, the researchers found that officers who have more gaming experience do not have to invest as much mental effort to navigate the virtual environment. These results suggest that designing and delivering VR training cautiously and intentionally may be one of the ways to reduce the mental effort that VR places on police officers. Some ways of doing this are described below.

How can the police use these findings?

The findings from the source article indicate that police officers respond to VR training with similar average heart rates and perceived stress compared to real-life training. This finding provides initial support for the consideration of adding VR to an agency's training curriculum to supplement (but not replace) real-life training.

When aiming to implement VR training, police agencies and trainers should select the training tool based on the training objective. For instance, when the training objective requires cognitive tasks and visual search, VR might be a suitable tool. However, when a training objective

requires high levels of physical activity (running, physical touch such as during the training of arrest skills), real-life scenario-based training appears a more suitable option.

Given that VR places additional mental effort on trainees, police agencies and trainers need to intentionally consider the design and delivery of VR training. In order to reduce mental effort spent on navigating the virtual environment, police trainers should introduce a familiarization period before starting the actual training scenarios. A familiarization period allows officers to explore how to navigate the virtual environment, how to use available tools (such as weapons like pepper spray and firearms), and how to engage with objects and persons in VR.

Particularly for police officers with little gaming experiences or affinity for technology, VR training should adhere to a specific structure: the initial exposure period should be kept brief while the breaks between re-immersion should be longer. The exposure periods (and thus the training scenarios) should become gradually and incrementally longer.⁵ In one training session, the active immersion time in VR should not exceed 30 minutes, particularly for first-time users as this may lead to cybersickness.

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