

COMMENTARY

From simulations to real-world operations: Virtual reality training for reducing racialized police violence

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Racialized police violence is a devastating reality that has gained particular notoriety in the United States. As I-O psychologists, we have a unique position that can contribute to society's collective responsibility to address this violence and prevent it from occurring in the future. As discussed in their focal article, Dhanani et al. (2022) posit that one opportunity for the field to have an impact is through training. In this commentary, we propose that an understudied and underutilized modality for training in police academies is virtual reality (VR); further, we highlight that VR can potentially be a more effective way of preparing police for the demands they face in the field. Although by no means should training be considered the only solution, we are optimistic that the positive attributes associated with training in VR will have a positive impact on both policing and the communities they serve.

Virtual reality training for combating racialized police violence

In their chapter on VR and diversity training, Collier-Spruel and Alanis (2022) propose VR training as a method that offers promising results for the transfer of knowledge and skills to the workplace, particularly with content that relates to diversity, equity, and inclusion. Relevant to the present paper, Collier-Spruel and Alanis (2022) also discuss the importance of VR diversity training for addressing policing behavior. Specifically, they argue that VR training may be beneficial for implicit bias training and overall practice opportunities due to the immersive elements of the experience and the ability for trainees to encounter situations to which they have previously not been exposed. In fact, the immersive experience of being in a virtual environment has been found to positively relate to both trainee reactions and learning outcomes (Fassbender et al., 2012; Shibata, 2002). Although organizational research supporting the use of VR training for policing is lacking, there is evidence supporting the effectiveness of this form of training. For instance, Grantcharov et al. (2004) found that surgical trainees who underwent VR training performed better than their counterparts who received no VR training; not only did they perform surgery faster and with less error, there was also an improvement in their psychomotor skills. As another example, the US Army found that pilots who trained in VR for the initial stages of flight school performed at the same level as pilots who went through traditional training, saving both time and money in the training process (Dalladaku et al., 2020). Thus, although empirical evaluations of VR training for policing need further study, results from other job domains where work is high pressure and highly technical indicate that VR is an avenue worth exploring for police training. Further, VR training has been shown to be effective for soft skill development and has been successfully used to develop communication, negotiation, and intercultural competence skills (Xie, et al., 2021), all of which are essential skills for policing. In the following section, we discuss a set of

characteristics that we believe will contribute to the effectiveness of VR in police training and reducing racialized violence.

Key characteristics of virtual reality

Given that policing involves various physical demands, decision making in high-stress situations, proficiency using dangerous equipment, and community engagement skills, we see VR as a promising training option that will result in reduced racialized police violence.

Specifically, this is due to the opportunities to engage in high-fidelity simulations and participate in repeated practice in a safe environment. Additionally, the cost-effectiveness of VR means that such technology can be implemented in a training program that is limited in terms of budget or time.

High fidelity

VR training is unlike most other training methods given its ability to safely portray realistic presentations of situations, especially those that would be difficult or impossible to replicate in real life. For example, police cadets can immerse themselves in a role as a police officer where they are responsible for de-escalating a serious interpersonal situation. In the VR environment, multiple avatars, including the target, other police officers, and bystanders, may be involved, and the trainee would need to make decisions on how to handle the situation. The NYPD piloted such a program for active shooter drills with the company V-Armed, wherein police officers were immersed in free roam VR scenarios (e.g., a hostage situation) and had to interact with other officers, as well as features of the simulation like disruptive bystanders and enemy targets; then, officers received feedback on hard skills like the accuracy of their bullet trajectory as well as their ability to negotiate (Melnick, 2019).

In addition to situational fidelity, there are other characteristics that contribute to the effectiveness of VR training, for instance, psychological immersion, presence, and embodiment. Psychological immersion refers to an individual being immersed in the virtual environment rather than the real-life physical environment (Witmer & Singer, 1998, p. 227). Presence is a psychological state that arises when one's senses are engaged, their attention is captured, and they are actively involved (Witmer et al., 2005, p. 298). Together, immersion and presence are posited to be related to training outcomes such as trainee engagement, self-efficacy, learning, and transfer (Howard & Marshall, 2019). Last, embodiment is the set of sensations that come with having and controlling a body (Kilteni et al., 2012; p. 375). Embodiment is especially important for transfer of training because in order for the knowledge and skills learned during training to transfer from the virtual environment to the actual environment, the person completing the actions and making the decisions must act in accordance with how they behave during training.

A high-fidelity VR that emulates on-the-job situations and enables users' immersion, presence, and embodiment has the potential to afford police the opportunity to engage in first-hand practice of dangerous on-the-job situations and instill the skills necessary to appropriately respond when these situations occur in real life.

Practice opportunities

Opportunities to practice expected behaviors are critical when training police cadets or officers on appropriate behavior in dangerous situations, such as those that precipitate racialized violence. VR offers the opportunity to engage in repeated practice in a physically and psychologically safe environment. Koutitas, Smith, and Lawrence (2021) found a positive correlation between first responders who had repeated practice in VR training and their cognitive and physical memory posttraining; further, the first responders who practiced repeatedly in VR had better performance overall, with fewer errors and quicker responses than those who did not train in VR. VR

simulations can be designed such that practice can occur under the same or varying conditions depending on the objective of the training; for instance, a trainee may engage in repeated practice of a situation, but the person who they encounter may be of a different racial background. This training would simultaneously offer the benefit of practicing behaviors until the person reaches a state of automaticity while also training officers to remain consistent in their behaviors regardless of race. As mentioned, some scenarios may also not be possible to accurately portray in a training environment. However, with VR, individuals are not exposed to real danger and cannot harm others. Further, the virtual practice environment can provide a sense of psychological safety if individuals are not discouraged from or reprimanded for making mistakes but are instead encouraged to learn from them. VR presents a solution to training where individuals can learn about their unconscious bias and practice correcting such behaviors in a realistic simulation.

Cost-effectiveness

As stated in the focal article, US law enforcement agencies are faced with only a brief period of time to train their cadets (Reaves, 2016). In addition to offering high-fidelity situations and repeated opportunities for practice, VR also offers cost-effectiveness in terms of saving on labor requirements for training as well as reducing the time required for preparation. VR training is designed to be completed by an individual within the bounds of a headset, therefore costs associated with actors, trainers, or other individuals required for live role-play training scenarios can be minimized. Nonetheless, we recognize VR likely requires a substantial initial investment, and some police departments, particularly smaller ones, may face more difficulty accessing this technology. Even if costs are decreasing as the technology becomes more available, virtual headsets alone currently run from a few hundred to a few thousand dollars. Further, VR also requires a computer capable of running the software, and the software itself may incur a hefty cost. Although these expenses add up, we anticipate that this upfront investment will likely result in time and cost savings overall.

Implications of VR training for reducing racialized police violence

We have outlined three primary reasons why VR would be advantageous for training police in order to reduce racialized violence. Importantly, VR offers the unique opportunity for police to learn from and practice scenarios they may have never encountered before, as well as receive immediate feedback on their performance for a given task. When this practice takes place in a psychologically safe environment, trainees can be encouraged to learn from their mistakes rather than scolded for them, which is consistent with error management training. Furthermore, although in-person role-play scenarios are often assumed to be the most effective form of training, we argue that for police cadets and officers, it is particularly important to see both the positive and negative consequences of their actions. Whether practicing a de-escalation scenario or engaging specifically in unconscious bias training, the immediate feedback of witnessing the outcomes of their actions in a virtual environment with lifelike avatars can help instill a sense of reality in the training process which will ultimately impact the transfer of training.

Additionally, we believe that there are opportunities to explore the roles of empathy and perspective taking in training police with VR. A training simulation could be created such that police trainees must embody the role of the target or a bystander, prompting them to interact with a situation from a different purview. Given that characteristics of VR would make this kind of role-play more salient, trainees may be more likely to develop an understanding of what it feels like to be targeted based on one's racial background, which could supplement the effectiveness of existing unconscious bias training. Further, participating in a de-escalation scenario that devolves into an instance racialized violence from the perspective of the target, or the victim, may generate

new insights into how these situations occur and what behaviors police officers can avoid engaging in or begin implementing in order to minimize the likelihood that police interactions will result in racialized violence.

VR training also opens new opportunities for learning about officers' and cadets' decision-making processes. Specifically, scientists and practitioners alike can use a variety of information collected during these training simulations (e.g., eye tracking, physical movements, and physiological data) to predict the ways in which an officer or cadet may respond in a given situation. Such information can be also tracked over time and used to monitor an individual's learning progress, which can then inform the feedback they receive or the retraining they are required to take. For example, a VR simulation of a de-escalation encounter could capture whether police officers reach for a lethal or nonlethal weapon, what verbal and nonverbal behaviors they engage in, and how they rely on other officers to handle a situation; further, it can capture critical deviations from prescribed response norms. Understanding where in an encounter an officer's biases affect their behavior helps in predicting future instances of such behavior; additionally, it provides valuable feedback for how to tailor training for individuals and increase positive transfer into real-world situations.

Implementation of VR training in policing

Police organizations are already incorporating VR training into their curriculum. For example, VirTra, an organization that offers police simulator training for a variety of scenarios (e.g., de-escalation, judgmental use of force, marksmanship, and crisis intervention), has partnered with several U.S. law enforcement agencies (VirTra, [n.d.](#)). Apex Officer is an immersive VR platform that has been used in police departments and police academies across the United States; it offers simulated real-world situations for police officers to practice essential skills (Rhodes, [2020](#)). As another example, Axon VR uses VR scenarios to target police officers' tactical skills, preparedness, empathy, and coping mechanisms (Axon, [2022](#)). As is evident, numerous firms have been created that are dedicated to delivering positive training results through VR (e.g., Street Smarts VR, WRAP Reality, and InVeris Training). However, despite the prevalence of these organizations, we are not aware of any organizational research that has sought to empirically demonstrate the effectiveness of such VR training. As we struggle to keep pace with the development and implementation of VR diversity training, there is an urgent need to understand how VR can most effectively be incorporated into police training.

Conclusion

We have highlighted that one promising solution for reducing racialized police violence is VR training. Specifically, we argue that as VR can provide high-fidelity situations, opportunities to practice job-specific skills, as well as cost-effectiveness and efficiency, this modality opens the door for enhancing police training. As such training has already been adopted by police departments and other law enforcement agencies, we call on researchers to investigate its effectiveness and determine the next directions for its use. Additionally, we anticipate that this area of research will bring fruitful opportunities for learning more about the complex decisions that police officers make, as well as how VR technology can be used to supplement the knowledge and skill acquisition processes during training.

Further, we would like to highlight that VR has the potential to reduce racialized police violence outside of the training domain. As the focal article suggests, designing behavior-based selection measures is one avenue for improving personnel decisions, as applicants perform tasks that give insight into their implicit and explicit biases. The incorporation of a VR work sample in a selection

battery speaks to several of the points outlined by Dhanani and colleagues in their section on selection. First, VR is scalable and flexible; thus, the kind of tasks included as part of the work sample could be tailored to the needs of selection battery. Additionally, VR is high fidelity, and such methods better predict job performance and have less adverse impact.

Finally, given the fidelity of VR, it is more robust to faking, which is a concern in the high-stakes context of police selection.

In this commentary, we have emphasized why VR diversity training is one way for the expertise of I-O psychologists to be imparted into developing solutions for the plight of racialized police violence in the United States. VR is a useful technology with the potential to generate ample directions for further exploration in this area. We encourage organizational scientists to collaborate with researchers and practitioners in the field of criminal justice, including police organizations themselves, to further advance I-O psychology's contributions in this important area of work.

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