

# “That was cool!” Participant Response to a Mass Casualty Incident Virtual Reality Simulator

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## INTRODUCTION

- To minimize loss of life, modern mass casualty response requires swift identification, efficient triage categorization, and rapid hemorrhage control. Current training methods remain suboptimal.
- Virtual reality (VR) provides learners with the ability to practice in environments that more closely mimic real-life situations and may be a superior approach for simulating complex scenarios such as mass casualty incidents
- However, little is known concerning whether VR enhanced disaster training is an acceptable alternative for learners than other methods of disaster training.

## OBJECTIVE

Our objective was to train first responders to triage a mass casualty incident using Virtual Reality (VR) simulation and obtain their impressions of the training's quality and effectiveness.

## METHODS

- Prospective observational study of learner reactions to the use of an immersive virtual reality (VR) simulation of a terrorist bombing of an underground subway station.
- First VResponder is a high-fidelity, fully immersive, automated and programmable virtual reality (VR) simulation of a terrorist bombing of an underground subway station.
- We trained subjects in SALT Triage then had them respond to the terrorist bombing of a subway station in First VResponder
- We gathered learner reactions to their VR experience and post-encounter debriefing with a custom electronic survey.
- Descriptive statistics were calculated presenting the median (interquartile range) and frequency expressed as a percentage, as appropriate. To evaluate the impact on learner reactions to the VR experience, we stratified the analysis by whether the learner owned, or did not own, a VR system.
- Statistical analysis was performed with the Stata 17 version statistical package (Stata, College Station, TX, USA).

## RESULTS

Table 1: Population demographics stratified by learners who own or do not own Virtual Reality systems. Abbreviations: \*, p<0.05.

	Total (n=374) Frequency (%)	Own VR yes (n=64) Frequency (%)	Own VR no (n=310) Frequency (%)
Roles			
EMS trainee/clinician	322 (88)	54 (89)	268 (88)
Medical trainee/clinician	44 (12)	7 (12)	37 (12)
I consider myself a seasoned first responder	229 (61)	43 (67)	186 (60)
I have completed the SALT Triage Certificate Training Course†	124 (33)	29 (46)	95 (31)
I have completed triage training other than SALT Triage Training before	261 (70)	45 (71)	216 (70)
Number of disaster drills participated in before First Responder, mean (sd)	4.6 (13.4)	3.4 (4.0)	4.9 (14.5)

Table 2: Learner assessments of MCI VR experience for owners and non-owners of VR Systems (Likert scale: 1-5, strongly disagree to strongly agree). Abbreviations: \*, p<0.05.

Item	Own VR yes (n=64) Mean (SD)	Own VR no (n=308) Mean (SD)
I was adequately prepared to enter the mass casualty scene.	4.39 (.633)	4.32 (.601)
I needed more time to acclimate to the VR environment before entering	2.47 (1.13)	2.76 (1.12)
The orientation helped me navigating the virtual environment.	4.48 (.534)	4.38 (.579)
The virtual patients responded to my commands.	4.06 (.852)	4.07 (.725)
Navigation throughout the subway station was challenging.	2.28 (1.13)	2.54 (1.04)
I found it easy to use the instruments in the medical kit.	4.38 (.630)	4.19 (.741)

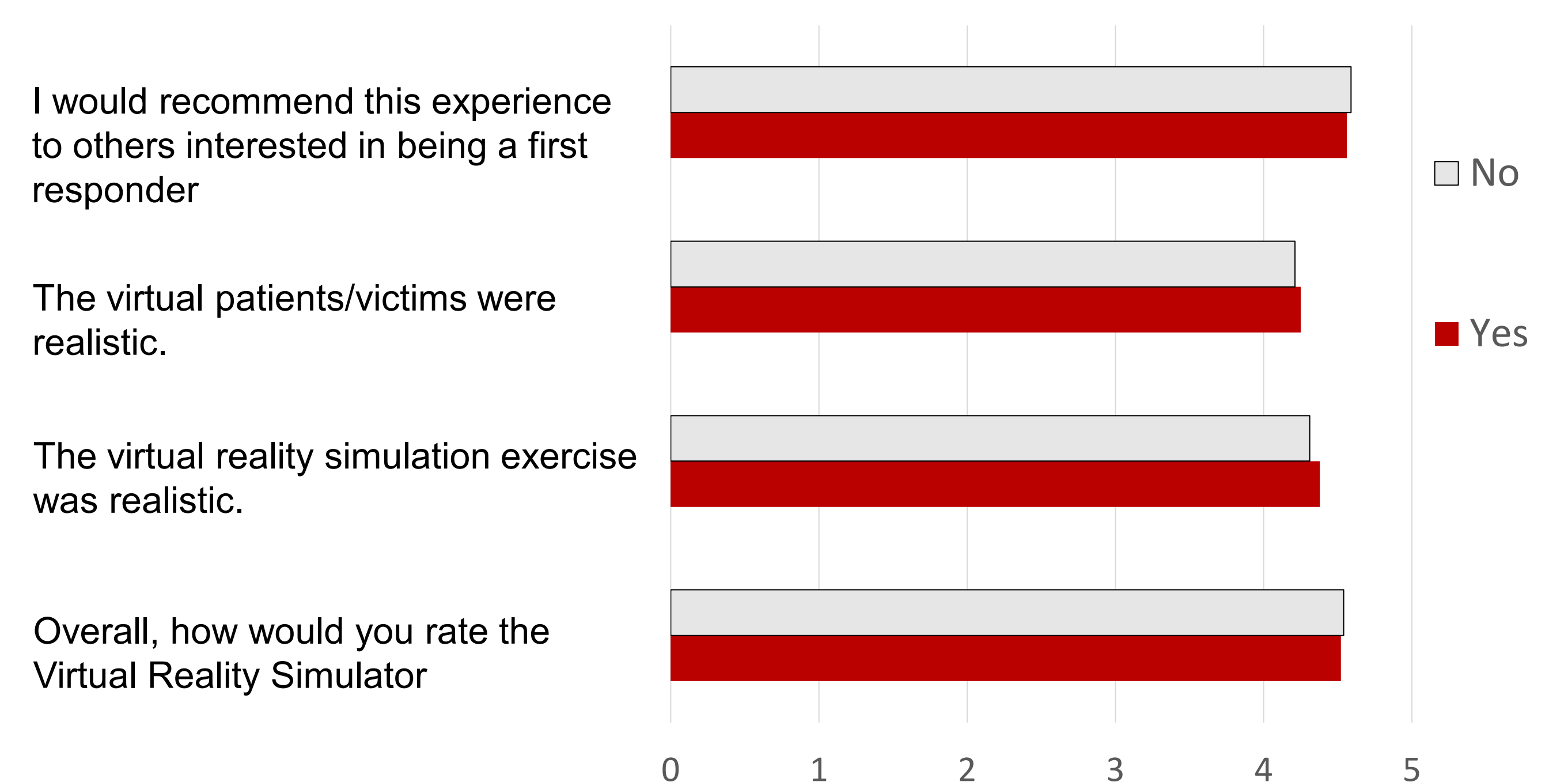


Figure 1: Overall Assessment of the VR experience by learners who do (Yes) or do not (No) own a Virtual reality system (Likert scale: 1-5, strongly disagree to strongly agree).

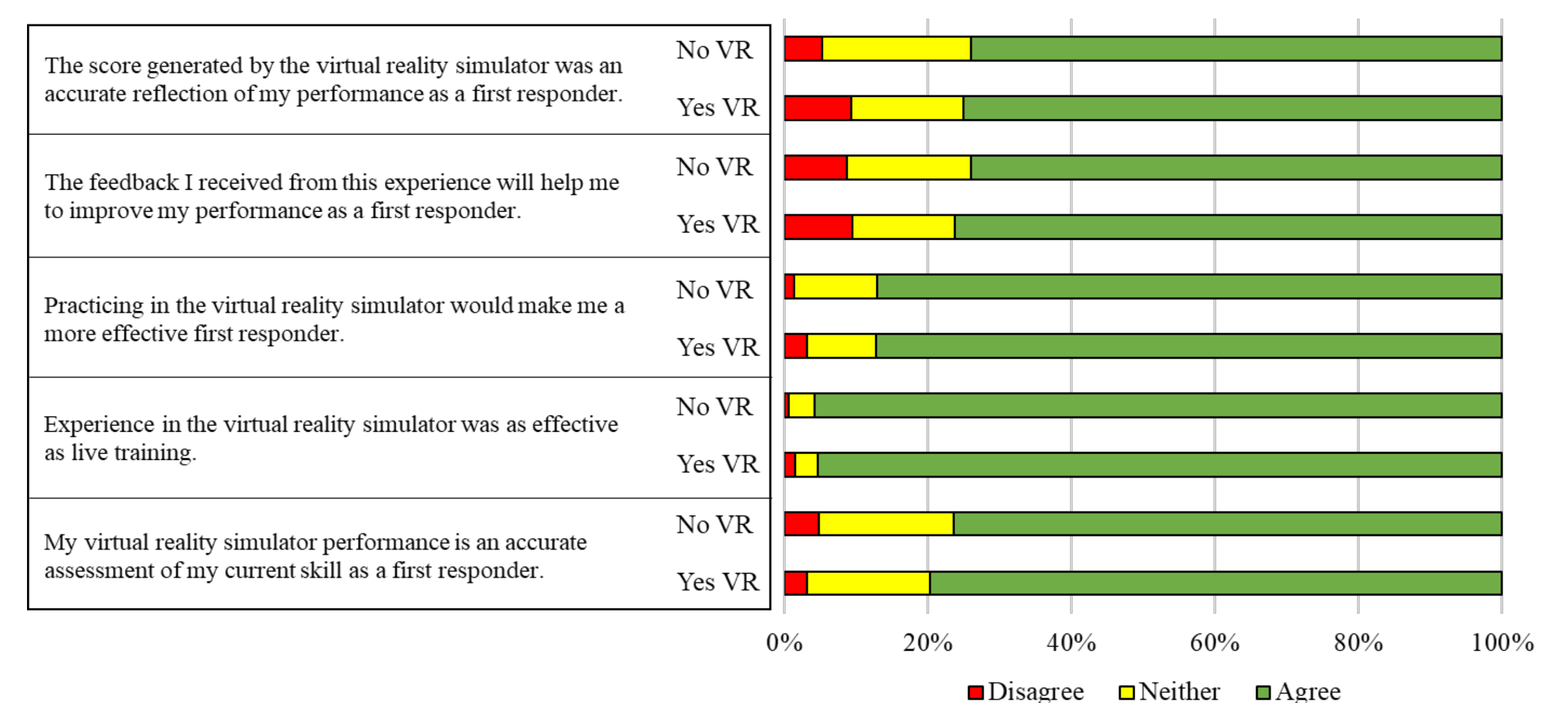


Figure 2: Learner perceptions of the training potential (% agree/disagree) of MCI VR simulations stratified by owners (Yes VR) and non-owners of VR (No VR) systems. Abbreviations: \*, p<0.05.

## CONCLUSION

- First VResponder is a high quality and effective alternative for disaster training.
- Regardless of prior VR experience, participants perceived the encounter as effective for training.
- The overall participant experience was rated highly by participants regardless of prior VR experience.

