

## Introduction

Empathy is a core component of medical interviewing. Empathy is correlated with effective communication in the medical field. When a physician is empathetic, a patient feels more comfortable and valued. Within the context of medicine, empathy is considered to be the understanding of the patient's inner and unique feelings that they have as an individual. The main mechanisms that have been utilized to improve empathy include standardized patients and role-playing activities. Past studies have indicated that empathy can be taught or promoted in medical school curriculums (Benbassat and Bauml, 2004). The effectiveness of implementing virtual reality to promote empathy needs to be further explored. There is concern that standardized patients and role playing activities lack realism, which makes it difficult in regards to perspective taking. This is crucial to demonstrate empathy. The main goal of this project is to explore an alternative approach for promoting empathy in a medical context. The objective is to demonstrate that the use of virtual reality will help achieve the required element of realism, as it is a fully immersive medium.

## Aims and Objectives

**Aim I:** To identify the effectiveness of virtual reality in comparison to a non-virtual reality mediums in empathy and spatial presence scores.

**Aim II:** To evaluate what role perspective has in moderating empathy and spatial presence scores.

## Methods

59 participants were given a medical scenario using one of two mediums: virtual reality headset or a PC. The scenario was a short clip from the video game "That Dragon, Cancer." The clip is an interaction between two physicians who are discussing the unsuccessful cancer treatment of a young boy to his parents. The participants were also randomized based off of the perspective in which they viewed the scenario: the physician or the parent of the patient. The participants were randomized into one of the following conditions: VR/patient's perspective; PC/patient's perspective; VR/physician's perspective; PC/physician's perspective. Following the condition the participants took a post-test to assess empathy and spatial presence. The items used to assess empathy were adapted from Campbell and Babrow, 2004. The spatial presence scale was adapted from Hartmann et al., 2015. The questions were divided into 2 categories: compassionate empathy toward the patient and his parents and the spatial presence experience. The data was analyzed using ANOVA. A p value of less than .05 was considered to be significant.



Figure 1. Screenshot of medical interaction used from video game.

## Results

A randomization check was conducted for age, gender, race, and school year. All 4 background variables were found to be insignificant. There was a significant effect of the platform on the mean score of compassionate empathy toward the patient and his parents, with the virtual reality platform having a greater mean score,  $F(1, 59) = 4.94, p = .030$ . There was no significant effect of perspective on the mean score of compassionate empathy toward the patient and his parents,  $F(1, 59) = 2.85, p = .097$ . There was no significant interaction between platform and perspective on the

mean score of compassionate empathy toward the patient and his parents,  $F(1, 59) = 2.21, p = 0.143$  (Figure 2 and Table 1).

ANOVA - Q1 Mean Score (1-7)

	Sum of Squares	df	Mean Square	F	p
Platform	2.233	1	2.233	4.94	0.030
Perspective	1.286	1	1.286	2.85	0.097
Platform * Perspective	0.997	1	0.997	2.21	0.143
Residuals	26.662	59	0.452		

Table 1. Q1. Compassionate Empathy toward the patient and his parents.

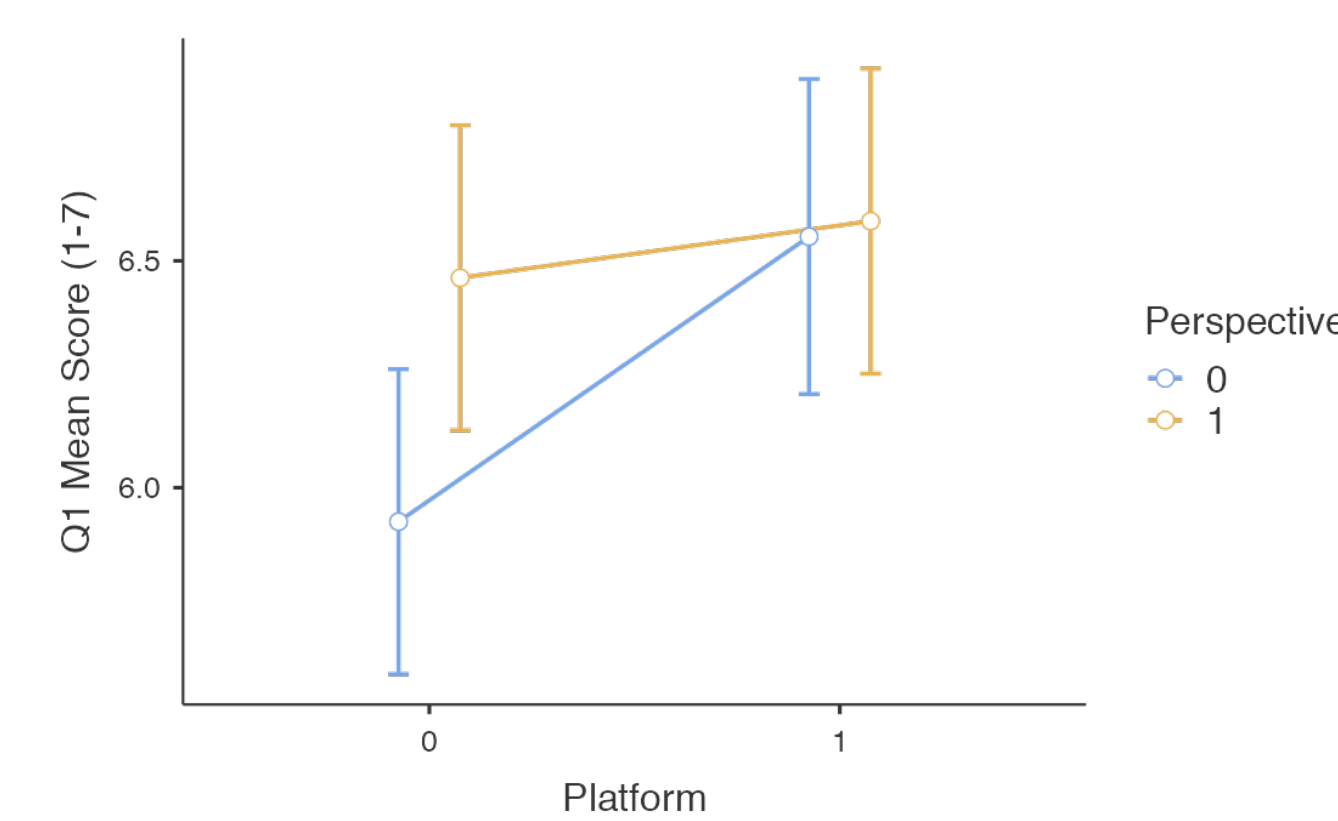


Figure 2. Q1. Compassionate Empathy toward the patient and his parents. Perspective: 0 = Parents' Perspective, 1 = Healthcare Providers' Perspective. Platform: 0=PC, 1=VR.

There was a significant effect of the platform on the mean score of spatial presence experience, with the virtual reality platform having a greater mean score,  $F(1, 59) = 5.164, p = .027$ . There was no significant effect of perspective on the mean score of spatial presence experience,  $F(1, 59) = 0.848, p = .361$ . There was no significant interaction between platform and perspective on the mean score of spatial presence experience,  $F(1, 59) = 0.308, p = 0.581$  (Figure 3 and Table 2).

ANOVA - Q2 Mean Score (1-7)

	Sum of Squares	df	Mean Square	F	p
Platform	3.498	1	3.498	5.164	0.027
Perspective	0.574	1	0.574	0.848	0.361
Platform * Perspective	0.209	1	0.209	0.308	0.581
Residuals	39.964	59	0.677		

Table 2. Q2. Spatial Presence.

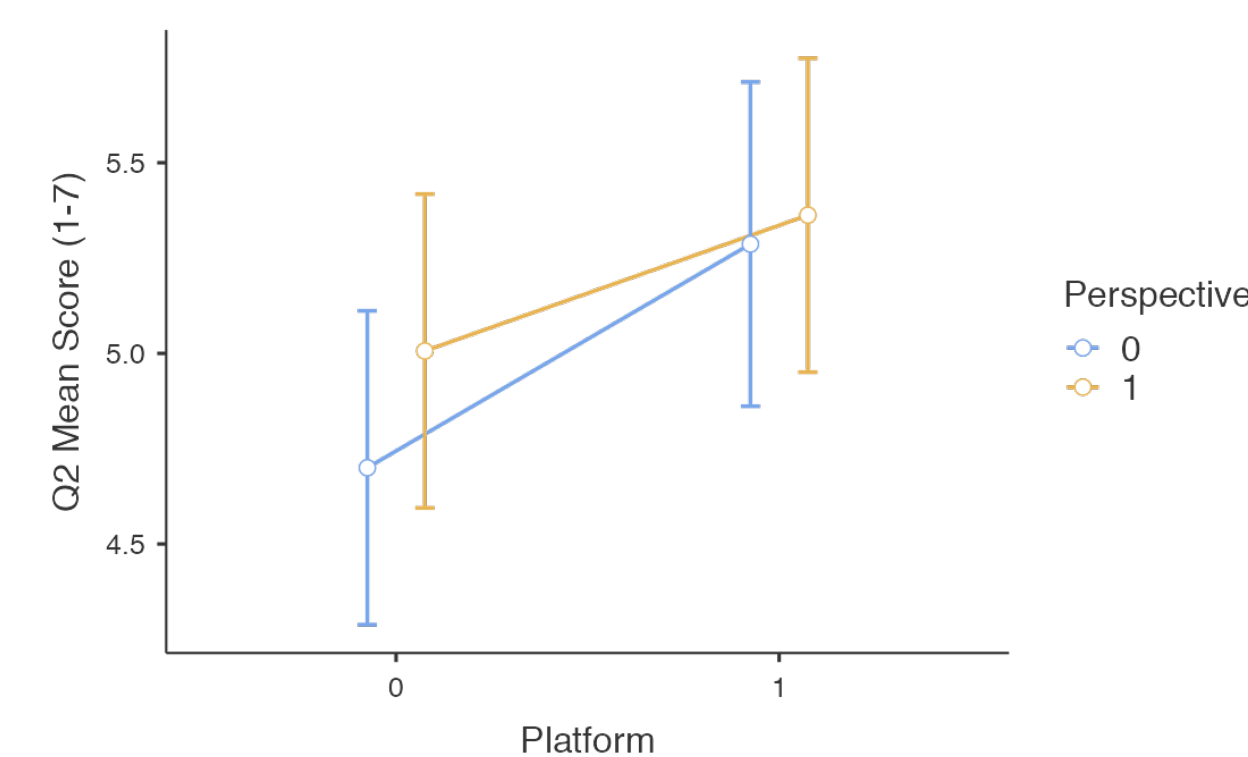


Figure 3 Q2. Spatial Presence. Perspective: 0 = Parents' Perspective, 1 = Healthcare Providers' Perspective. Platform: 0=PC, 1=VR.

## Conclusions

The results of this study were limited by sample size due to COVID-19 preventing in person data collection. However, despite the smaller sample size a significant relationship demonstrates greater empathy scores and spatial presence scores with the virtual reality medium over the PC. These results are valuable because virtual reality is a potential strategy in promoting empathy in health care curriculums that is more accessible for programs that are unable to fund standardized patients. In a previous study participants rated experiencing virtual patients was comparable to that of standardized patients (Stevens et al., 2006). These results also indicate that there is value in watching patient scenarios with regards to empathy. A major limitation to this study is the smaller sample size, it would be beneficial to complete this study with a larger sample size in order to determine significance or lack thereof in regards to the role of perspective taking. Additionally, due to the smaller sample size, modulating variables such as gender differences were not able to be accounted for. Another limitation of this study is not controlling for differences in baseline empathy, as a participant with greater baseline empathy is likely to score higher in the post test regardless of their testing conditions.

## References

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