

The Effects of Roleplaying Orientations on Transformative Learning and Perspective Taking in Virtual Reality

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Abstract. Roleplaying games, especially when augmented with the affordances of virtual reality, have the potential to foster prosocial behaviors by facilitating positive perspective taking. In roleplaying games, the orientation phase is particularly crucial, as it provides players with the necessary background information about their role and simulated scenario. However, little research has focused on the effect of orientations in players' tendency to engage in transformative learning and perspective taking during roleplaying games. To address this gap, we conducted an experiment examining the impact of affinity-specific orientations (information that portrays the role as in- or outgroup) on players' perceptions in a VR-based roleplaying game called *On the Plane*. Our qualitative findings indicate that orientations influence players' appraisal of role-play characters and their engagement in transformative learning and perspective taking.

Keywords: Roleplaying · Roleplaying Games · Narrative Games · Xenophobia · Transformative Learning · Virtual Reality

1 Introduction

Roleplaying games, in which players are immersed in a fictional role that encourages them to embrace the thoughts and behaviors of the character described in the role, have the potential to support and promote prosocial behaviors. When coupled with the unique affordances of virtual reality (VR), roleplaying games can be used to enable players to engage in positive perspective taking to better understand others' viewpoints on social issues that usually emanate from a failure to approach social situations from their perspective.

Within the context of roleplaying games for social good, the process of perspective change is achieved through transformative learning and perspective taking, which are directly linked. Transformative learning refers to a profound and lasting change in one's beliefs, attitudes, and perspectives as a result of engaging in a reflective and critical appraisal of one's own assumptions and experiences [1]. Engaging in transformative learning experiences involves engaging in perspective taking, which involves approaching social issues from the perspective of others

by actively considering their viewpoints, feelings, and beliefs when evaluating such social issues. Therefore, roleplaying games are exceedingly powerful tools for enabling players to embody and experience different roles and perspectives, thereby facilitating their engagement in transformative learning processes. By assuming the thoughts, emotions, and behaviors of a fictional character, players can step outside their own worldview and have a unique opportunity to take on alternative viewpoints in simulated environments. This immersive experience can lead to transformative shifts in individuals' beliefs, attitudes, and understanding of others both in physical and virtual worlds.

One critical aspect of roleplaying games is the orientation phase, wherein players are oriented to their role. Past research [2] asserts that for a successful roleplaying perspective taking activity, individuals need to be provided with sufficient background information to effectively engage in roleplaying and perspective taking. This orientation phase usually has a priming role to prepare players to approach the game with an understanding of the context, objectives, and constraints of the roleplaying scenario. Through orientations, roleplaying games immerse players in the simulated world and help them embrace their designated roles.

Despite the importance of orientations in roleplaying games, existing research provides scarce information regarding the role of orientations in individuals' engagement in transformative learning and perspective taking during roleplaying games. To address this need, we conducted an experiment examining the effect of affinity orientations on players' perceptions of a VR-based roleplaying game. We hypothesize that: *The presence of orientation in a roleplaying game results in more effective transformative learning and perspective taking in contrast to no orientation.*

2 Background Review

Roleplaying has been suggested as a tool for transformative learning and perspective-taking in different contexts and for different groups. For example, Wentink [10] used roleplaying with preschool and elementary students, Hughes [11] used it with adult therapy patients, Klafehn et al. [12] used it with cross-cultural communication trainees, and Athanases and Sanchez [13] used it with teacher education students. Hughes [11] offers roleplaying games as cultural systems and game characters as personal symbols of reference in their role in therapy and healing.

Digital role-playing games (RPGs) have been used in previous studies for a variety of purposes. For example, Harrell et al. [14] developed an interactive narrative called *Grayscale* to encourage reflection on gender discrimination in the workplace. The authors of this study assert that RPGs can better model social identity and interactions than other types of games, which often do not highly value complex models of identity for non-player characters.

Past research highlights the additional effectiveness of VR in transformative learning (see [15] for a meta-overview of using VR as a strategy to reduce im-

PLICIT racial bias, as well as [16] for case studies of VR use in other transformative learning context). Gupta *et al.* [17] provide four design principles for transformative roleplaying in VR: (1) explicit and well-specified roles; (2) coupling the player’s body and the character’s body; (3) high interactional density; and (4) allowing players to ease gently into the experience. Out of these four principles, we consider *On the Plane* to match all except high interactional density (in this game, the users make only four choices).

3 Methodology

For our study, we used *On the Plane*, which is a roleplaying game that simulates the flight experience of a Muslim American woman who wears a hijab (Sarah), as seen in Fig. 1. The VR experience is a five-minute simulation of an everyday life situation where intergroup biases manifest themselves. We conducted the study in a digital VR environment (as opposed to a board game, a dialogue-based table-top role-playing, a screen-based digital game, etc.) to facilitate a single-player experience in a setting that feels more private and intimate. In the experience, participants play as Sarah, who is sitting on a plane next to Marianne, a woman who presumes that Sarah cannot be an American because of her appearance and displays xenophobic attitudes toward her from subtle to more overt. Marianne’s comments mostly stem from misconceptions about Sarah’s looks, beliefs, origins, hometown, profession, and education. Participants are presented with four interactive prompts throughout the experience and are asked to choose how they want to respond to Marianne’s questions/comments. These prompts range from recognizing Marianne’s questions as ignorance to aggression, and from responding by disregarding to rectifying them.

The independent variable in the experiment is the affinity orientation provided to the participants. There are two levels of the independent variable: outgroup affinity and no affinity. At the beginning of the VR experience, participants are presented with an affinity orientation that describes the role they will be assuming during the experiment (see Table 1). The affinity orientation is manipulated between subjects, such that half of the participants are presented with the orientation designed to invoke an explicit outgroup affinity, while the other half is presented with an orientation including no affinity description.

Our qualitative analysis is based on the responses to five open-ended questions that were presented to the participants after going through the VR experience. Participants answered the questions while still inside the VR environment. These questions were based on Mezirow’s [1] “*Ten Phases of Transformative Learning*” (see Table 2), more specifically the first five phases that focus on (1) *disorientation* wherein we meet with an uncomfortable perspective that opposes our current ones, (2) *self-examination* wherein we examine how our own views align with the new perspective, (3) *assessment* wherein we evaluate our preconceptions and knowledge of the issue, (4) *recognition* wherein we recognize the existence of others who are holding this new perspective or are being affected by it, and, finally, (5) *exploration* wherein we explore what our new role in the issue



Fig. 1. VR Experience: On the Plane simulates the flight experience of a Muslim American woman wearing a hijab. Players experienced the simulation from a first-person perspective as Sarah (left) and interacted with the other passenger, Marianne (right).

can be. Since the other five phases (through 6 to 10) focus on acting (planning a course of action, acquiring knowledge, trying new roles, building confidence, and reintegration), we cut them from our exploration as we did not expect our participants to move into action in the short time during or after the VR intervention.

Our participants were composed of a total of 118 university students, with 29 females, 63 males, and 26 participants who did not provide a response to the gender question. All participants self-identified as non-Muslims, with an average age of 25 years old. The participants were randomly assigned by the system to one of the two experimental conditions, ensuring an equal distribution of participants between the two conditions.

Upon arrival in the lab, participants were given the informed consent form. Then, they received instructions about the study and were shown how to use the VR controllers. Next, the experimenter helped participants don the VR headset (a Meta Quest 2 headset). Participants went through the VR experience on their own and answered the study questions at the end of the VR experience while still wearing the VR headset by responding to questions presented to them in the VR application. Out of 118 participants, not all of them provided answers to all of our questions. The number of provided answers was 69 for question 1 (Q1; 58.5%), 74 for Q2 (62.7%), 70 for Q3 (59.3%), 72 for Q4 (61%), and 68 for Q5 (57.6%).

The lead author read all the responses and qualitatively coded them into categories through question-specific codebooks and themes [3]. How these codings were made and analyzed is explained per question in the results section.

Table 1. Orientations used for experimental manipulation

Condition	Orientation
Outgroup Affinity	You are Sarah, a Muslim woman born in Indianapolis, IN. You travel frequently for work and family visits. <i>As a Muslim woman, you have experienced prejudice when traveling and have had to deal with others' biased perceptions triggered by your appearance.</i> Over the weekend, you visited friends in Chicago. You just took your seat, <i>hoping that you can complete just one trip without anyone pointing you out for how you look.</i> You are looking around as you listen to a boarding announcement. A woman just took the seat on the other side of the aisle, and you smiled at her as she settled in.
No Affinity	You are Sarah, A Muslim woman born in Indianapolis, IN. You travel frequently for work. Over the weekend, you visited friends in Chicago. You just took your seat. You are looking around as you listen to a boarding announcement. A woman just took the seat on the other side of the aisle, and you smiled at her as she settled in.

Table 2. Mezirow's [1] Ten Phases of Transformative Learning

Phase	Explanation
1. Disorientation	The learner meets with a dilemma that challenges their views
2. Self-examination	The learner determines how their current views align with the new perspective and explore their feelings about the situation
3. Assessment	The learner needs to face their assumptions and knowledge or lack thereof
4. Recognition	The learner realizes that others are facing similar dilemmas and have gone through transformational changes, or are directly affected by the issue
5. Exploration	The learner explores what new roles they can assume in the issue
6. Planning	The learner plans a course of action
7. Knowledge Acquisition	The learner acquires skills or knowledge to implement the actions that they have planned
8. Trying New Roles	The learner assumes and interacts through their new role(s)
9. Building	The learner builds confidence and competence for their new role(s)
10. Reintegration	The learner integrates their new perspective into their life

4 Results

4.1 Disorientation Phase

How would you characterize the fellow passenger Marianne’s attitudes toward Sarah, whose role you played?

We position our VR intervention as a disorienting dilemma that initiates a transformative learning opportunity. For participants who feel similar to Sarah, embodying Sarah in the story gives them a chance to properly evaluate previous experiences they may have lived through. For participants who do not feel similar to Sarah, embodying Sarah gives them a chance to imagine how they would have reacted in similar situations. Accordingly, as a first step, we wanted to understand how the interaction between the two characters was perceived to evaluate whether it constituted a *disorienting dilemma*. We surmised that since the participants took on the role of Sarah, the stronger feelings they had toward Marianne (whether negative or positive), the more disoriented their perspectives had become.

We elicited the adjectives used to describe Marianne’s attitude in the responses and used an existing valence analysis framework (AFINN-en-165 [6]) that rates words with a numerical value between -5 and +5 based on their valence to group them into five categories as very positive (between +5 and +2.5), positive (between +2.5 and 0), neutral (0), negative (between 0 and -2.5), or very negative (between -2.5 and -5.0). When the responses use multiple adjectives that have contradicting or matching scores, we calculated an average score. These results are given in Table 3 and Fig. 2.

Table 3. Analysis of the disorientation-phase open-ended question

	Affinity ($n=42$)	No-Affinity ($n=27$)
Very Negative (e.g., racist, abhorrent, bitch)	16.7% ($n=7$)	22.2% ($n=6$)
Negative (e.g., ignorant, rude, biased)	47.6% ($n=20$)	55.6% ($n=15$)
Neutral (e.g., normal, curious)	21.4% ($n=9$)	14.8% ($n=4$)
Positive (e.g., friendly)	11.9% ($n=5$)	3.7% ($n=1$)
Very Positive (e.g., inclusive, good)	2.4% ($n=1$)	3.7% ($n=1$)

The results for the first phase present a mixed bag. First, affinity or no-affinity, most participants described Marianne’s approach as dominantly negative. Accordingly, we accept it as an effective disorienting dilemma. Second, looking at the numbers closely, on the one hand, participants with no-affinity condition were more likely to describe Marianne’s approach negatively and less likely to describe it as neutral or positive. On the other hand, participants who were presented with an affinity clause were more likely to describe Marianne’s approach as neutral or positive and less likely to describe it as negative or very negative.

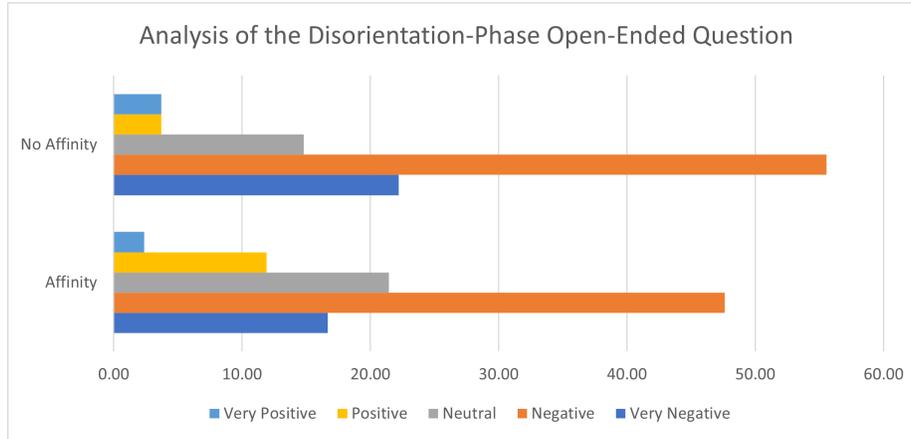


Fig. 2. Analysis of the Disorientation-Phase Open-Ended Question

Although counter-intuitive, we can offer some explanations for these results. When the participants were presented with an affinity clause and then were asked to role-play Sarah, the affinity (“[you are] hoping that you can complete just one trip without anyone pointing you out for how you look”) could have been perceived as a *game goal* and caused a resilience or avoidance effect where the participants approached the situation through dismissal and de-escalation. In fact, in our scenario, the less Sarah resists Marianne’s questions, the more subtle Marianne stays. In the other case where the participants were not given an affinity clause, the participants could have been caught unprepared faced with microaggressions, and, as a result, acted more confrontational. Accordingly, preparation for bias [4] has been offered as a coping strategy for racial and ethnic socialization (R/ES).

4.2 Self-Examination Phase

How familiar are you with any of the characters or interactions in this scenario?

As a plain and simple self-examination process, we asked participants about their familiarity with the characters and the situation. Through thinking about this familiarity, the participants were also given the chance to explore their perspectives and feelings.

The participants with the affinity condition reported stronger familiarity and were more likely to highlight characters and interactions in their responses (see Table 4). The affinity clause gave many participants an initiative to look at the existence of people who were similar to Sarah in their lives. Some responses were: “I have a friend in Saudi Arabia who was afraid to tell me where he was from because I am American, and he thought [I] would judge him due to that;” “[I] had a Muslim roommate for two years;” “I am familiar with the [character] in the sense that I have Muslim friends.” Some affinity-conditioned participants also

Table 4. General and specific familiarity of the participants with the characters and interaction

	Affinity ($n=45$)	No-Affinity ($n=29$)
No Familiarity	33.3% ($n=15$)	44.8% ($n=13$)
Weak Familiarity	26.7% ($n=12$)	17.2% ($n=5$)
Strong Familiarity	40% ($n=18$)	37.9% ($n=11$)
Familiarity with Sarah	8 reported	3 reported
Familiarity with Marianne	2 reported	1 reported
Familiarity with the interaction	9 reported	3 reported

compared their own experiences with Sarah: “I think I’m pretty familiar with what Sarah [as] I too belong to the minority community here in the US and have faced similar situations;” “I am familiar with the microaggressions she faced.” The affinity-conditioned participants were also more likely to disclose familiarity with the scenario such as: “I’m not familiar with the characters but although I never lived the interaction, I am aware of these encounters;” “I’ve seen this kind of racial stereotyping before;” “Very familiar with having to choose between appeasing someone else and their notions as opposed to being true to myself.” We offer the conclusion that providing affinity helped participants look deeper into their own experiences and create stronger familiarity and direct parallels with the characters.

4.3 Assessment Phase

To what extent did you find the characters or interactions in this scenario to be realistic?

In order to have participants assess their assumptions and knowledge about the characters, we asked them to talk about the realism of the characters and interactions. We mobilized the same valence analysis framework to categorize the responses into three categories: not realistic, realistic enough, and very realistic (see Table 5). Our use of realism here had a double meaning: the participants could answer the question from the lens of social interaction, character, and dialogue realism versus the visual and application fidelity. We assumed that the more the participants commented on the realism of social interactions, characters, and dialogue realism, the closer their approach would be to a self-assessment.

When the participants reported unrealism from the lens of visual and application fidelity, they approached it through concepts like uncanny valley and focused on things like animation and acting. The concept of the uncanny valley is one of the primary issues with virtual agents, robots, and other forms of automated human-mimicking systems [5].

Table 5. The participants' realism perceptions of the characters and interaction

	Affinity Condition ($n=42$)	No-Affinity Condition ($n=28$)
Not Realistic	16.7% ($n=7$)	10.7% ($n=3$)
Realistic Enough	40.5% ($n=17$)	60.7% ($n=17$)
Strong Familiarity	42.9% ($n=18$)	28.6% ($n=8$)

4.4 Recognition Phase

Do you know of other individuals who might be experiencing similar situations in their daily lives?

As the next step, we wanted the participants to reflect on and recognize the individuals in their own lives who are likely to become actors in this scenario. The participants either disclosed that they did not know anyone similar (39.5% of the affinity conditioned; 41.4% of the non-affinity) or drew parallels to people in their lives (see Table 6).

Table 6. The participants' recognition degrees

	Affinity Condition ($n=43$)	No-Affinity Condition ($n=29$)
No Recognition	39.5% ($n=17$)	41.4% ($n=12$)
Recognition: Indeterminate	27.9% ($n=12$)	37.9% ($n=11$)
Recognition: Acquaintances	11.6% ($n=5$)	3.4% ($n=1$)
Recognition: Friends	16.3% ($n=7$)	13.8% ($n=4$)
Recognition: Myself	4.7% ($n=2$)	3.4% ($n=1$)

Although many positive answers were indeterminate (the participant mentioned that they recognized the people in the scenario, but did not draw any solid parallels to specific individuals in their lives), some answers provided specific stories about acquaintances (specifically from underrepresented groups; responses such as “African American people, people of Asian descent, anybody of color [around me]”), close friends (e.g., “I have friends who have experienced prejudice and racism every day;” “most of my friends [who] are also not natives of USA”), or themselves (e.g., “[because] I’m also not white;” “[I] myself face this situations”). Despite the percentages of negative and total positive answers being similar, the affinity-conditioned participants were more likely to reflect on and recognize individuals in their lives as possible actors in such a scenario.

4.5 Exploration Phase

To what extent did any of the characters or interactions in this scenario influence or make you question your perspective on similar events?

Finally, we provided an exploration opportunity to the participants by reflecting on their experiences with the scenario and how the interaction affected

them. The responses were coded into seven categories with five of them reporting and two not reporting any change or reflection (see 7).

Table 7. The participants’ self-report of change or reflection as a result of the experience

	Affinity ($n=41$)	No-Affinity ($n=27$)
Change/Reflection (Unspecified)	7.3% ($n=3$)	29.6% ($n=8$)
Change/Reflection (Behavioral)	9.8% ($n=4$)	-
Change/Reflection (Empathy)	4.9% ($n=2$)	3.7% ($n=1$)
Change/Reflection (Reflection)	22% ($n=9$)	7.4% ($n=2$)
Change/Reflection (Dialogue)	12.2% ($n=5$)	-
No Change/Reflection (Familiarity)	26.8% ($n=11$)	51.9% ($n=14$)
No Change/Reflection	17.1% ($n=7$)	7.4% ($n=2$)

Change/Reflection (Unspecified): Some participants (7.3% of affinity conditioned; 29.6% of no-affinity conditioned) reported a change or reflection without specifying any details. No-affinity-conditioned participants were more likely to be unspecific while affinity-conditioned participants provided details about their experiences that moved them to other categories.

Change/Reflection (Behavioral): 9.8% of the affinity-conditioned participants reported that they consider changing their behaviors as a result of the experience (e.g., “I should be more compassionate and understanding as well as patient with people;” “[I] should not judge people by the way they look because it is never a good thing”). There were no similar reports within the no-affinity-conditioned participants.

Change/Reflection (Empathy): Three participants in total reported that they feel a heightened empathy toward the characters after the experience: one of them was directed toward Sarah (“feeling what Sarah experiences invoked compassion”), the other was directed toward Marianne (“not everyone who gives in to stereotypes [is] doing it from a bad place they are just woefully ignorant”), and the final was toward the interaction in general (“[the scenario] gives me a sense of empathy”).

Change/Reflection (Reflection): Affinity-conditioned participants reported a higher percentage of reflection and questioning as compared to no-affinity-conditioned ones (22% versus 7.4%). Some examples are: “it made me wonder how often people go through this;” “Sarah’s comments to herself made me question if appeasing was the right decision;” and “one question answered by Sarah [made me question my perspective].”

Change/Reflection (Dialogue): 12.2% of the affinity-conditioned participants reported that they are more likely to be mindful of their dialogue with strangers in the future. There were no similar reports within the no-affinity-conditioned participants. Some examples of these reports were: “I would try to be less annoying asking questions to a stranger;” “[I learned] to watch what I say a little better;” and “I think now I will be more cautious when interacting with people from different backgrounds and not ask sensitive things.”

No Change/Reflection (Familiarity): Almost half (51.9%) of the no-affinity conditioned participants reported no change and explained it from the lens of being already familiar with the situation. This was only a quarter (26.8%) for the affinity-conditioned participants. Some of these reports were: “I’m pretty open-minded so no [change];” “It did not make me question [my perspective because I] have been through similar experiences;” and “I questioned myself every day [so] this is nothing new to me.”

No Change/Reflection: Some participants (17.1% of affinity conditioned; 7.4% of no-affinity conditioned) reported a change or reflection without specifying any details.

5 Discussion

In this paper, we conducted a qualitative exploration into the effect of roleplaying orientations on players’ engagement in transformative learning and perspective taking within the context of a VR-based roleplaying game simulating how xenophobia manifests itself in an everyday situation. Our qualitative coding highlights some differences between how affinity-conditioned participants responded to the open-ended questions as opposed to no-affinity-conditioned ones.

To begin with, regardless of the presence of the explicit affinity orientation, most participants described Marianne’s approach as dominantly negative, pointing to the effectiveness of the simulation in portraying xenophobic attitudes and behaviors. In addition, we found that providing an affinity clause resulted in participants being more likely to describe Marianne’s approach as neutral or positive and less likely to describe it as negative or very negative. We postulate that the affinity clause caused the participants to approach the dialogue with de-escalation strategies, resulting in the experience feeling less contested. Also, providing an affinity clause helped participants look deeper into their own experiences and create stronger familiarity and direct parallels with the characters, a finding consistent with our prediction and prior research into transformative learning [1].

The participants who were presented with the affinity orientation were more likely to talk about the experience as being very realistic, pointing to utility of orientations in increasing perceived realism of roleplaying scenarios. By the same token, participants in the affinity orientation condition were more likely

to reflect on and recognize individuals in their lives as possible actors in such a scenario, showing the effectiveness of orientation manipulation in promoting reflective thinking, a crucial component of transformative learning. Lastly, participants in the affinity orientation condition were more likely to provide a detailed description of the change that the experience caused for them; they reported behavior change and dialogue reflection that was not reported by any no-affinity-conditioned participant.

5.1 Limitations

Our findings should be interpreted in light of a few limitations related to our data collection process. The responses to the open-ended questions that constitute the basis of our qualitative analysis have been gathered in the VR environment. The participants had two options to enter their responses: (1) typing through a virtual keyboard with VR controllers, and (2) using an English speech-to-text system (based on Meta’s Wit.ai speech-to-text API). The participants could have also merged the use of these options. On the one hand, the virtual typing option could have presented a detriment to the length and breadth of the responses. On the other, although the speech-to-text option is easier to use, it could have presented a challenge to participants whose mother tongue is not English. Future studies could conduct follow-up interviews and present the same questions to gather more in-depth data about participants’ engagement in transformative learning and perspective taking. Other areas of future research could involve (1) longitudinal studies into the long-term effects of such interventions for perspective change; (2) the investigation of the impact of different (e.g., stronger, refraining, etc.) affinity orientations; and (3) situations involving different characters and attributes.

5.2 Conclusion

Our findings showed that the presentation of an orientation inducing affinity toward the character whose role participants assumed during gameplay influenced participants’ responses and perceptions, resulting in varying levels of engagement in transformative learning and perspective taking. Participants who were presented with the affinity orientation were more likely to perceive the dialogue as less negative, reflect on personal experiences, and recognize realistic parallels in their own lives. The affinity orientation also enhanced participants’ sense of realism and prompted perspective changes and reflections not reported by those without an affinity orientation. These findings highlight the important role of orientations in facilitating transformative learning and perspective taking, emphasizing the utility of tailored orientations in roleplaying interventions to support and promote positive perspective change.

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