**Characterizing first and third-person viewpoints and their alternation for embodied interaction in virtual reality**

In this paper, the researchers worked on assessing the viability of embodiment in third-person and first-person perspectives. They talked about how users feel about their virtual body ownership and also how they behave when alternating between points of view in VR applications. In the first part of the experiment, the participants were divided into two groups: the first group participants were able to control the movement of their virtual body whereas the second group participants had to watch the virtual body moving as recorded from the first group participants.

The second part of the research was more inclined to our current project. In the second part, each participant repeated the experiment thrice: first-person perspective, third-person perspective and the last one in which they could alternate between 1PP and 3PP. They had three approaches to alternate between 1PP and 3PP. In the first approach, a camera followed for a second a parametric curve with accelerating and decelerating phases. It wasn't efficient as it required a long trajectory and changes in the direction of movement which confused the participant. In the second approach, they used teleportation which made it difficult for the user to continue their tasks in a new POV. In the last approach, they allowed a straight line translation of the camera. While this takes place, the vision is slightly blurred and participants are able to resume after the transition.

(1PP)   (3PP)   (ALT)
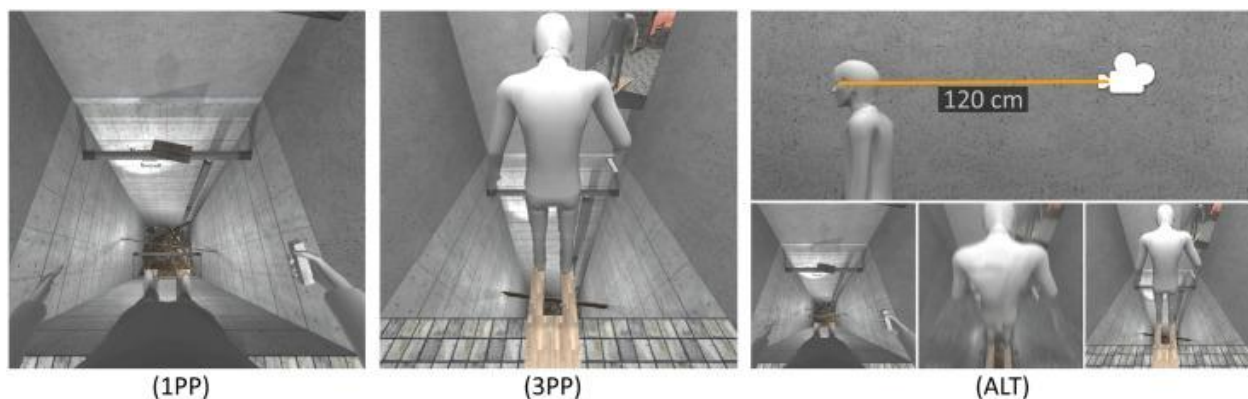
I really like the idea of alternating between the two perspectives 1PP and 3PP. It provides the user with a sense of control over their perspective and can help them better understand their environment in VR. A lot of factors would have to be considered while using the alternating approach as it may have a negative impact on the users. But it will provide us with a comparing factor along with 1PP VR and 3PP VR. It can probably help us better understand the immersiveness in each perspective as the user is able to alternate within the same setting.

They asked the participants to respond to a questionnaire based on body ownership, self-location and threat. There were a total of 48 participants. The results suggested that the ALT condition had a similar response to 1PP which indicated that it could be used in VR experiences. The 3PP in the first group of people who were able to move had a better sense of agency, body ownership, and self-location than those who were played prerecorded movements. 1PP suggested that participants viewing what the virtual body was viewing was enough for them to self-identify with the virtual body.

The alternating condition provides the best of both worlds: the contextual information as well as the connection with the virtual body. After building a sense of embodiment with the virtual body in 1PP, the user can then switch to 3PP.

Works Cited
Debarba HG, Bovet S, Salomon R, Blanke O, Herbelin B, Boulic R. Characterizing first and third-persons viewpoints and their alternation for embodied interaction in virtual reality. *PLoS One*. 2017;12(12):1–19.