

Abstract

People encounter events that violate physical laws in virtual worlds, yet they do not simply treat them as something they cannot understand. Instead, they make sense of how that world works by drawing on past experiences and evaluations. This study investigates **how people form an understanding of virtual worlds**. We developed a questionnaire scale to measure player experience in video games that contain many non-realistic events, **enabling us to empirically examine the process of understanding**. Using this scale, we found that **experiencing a new game can reshape how previously experienced worlds are evaluated**, a phenomenon we call a retrospective effect. These findings provide **a basis for designing virtual worlds that people can naturally engage with**, supporting more immersive learning and training experiences that promote lasting behavioral change.

What is “Sekai-kan” (a world)?

One’s understanding of how a world works.

■ Non-realistic worlds

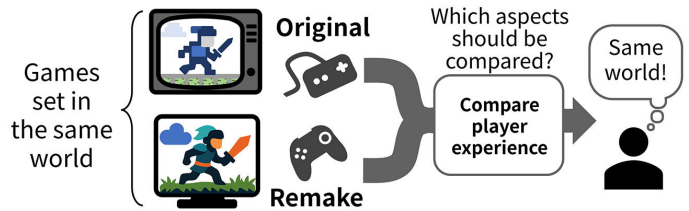
Games and VR offer many diverse worlds beyond reality.
→ Useful for studying how people understand a world.

■ How people understand and create non-realistic worlds

By examining which aspects of game experience make non-realistic worlds feel similar to each other, we aim to clarify how people form an understanding of non-realistic worlds.

- Magic ✨
- Space 🌌
- Horror 👁️
- etc.

■ Player experience in video game remakes
Remakes reconstruct the world of the original.
Comparing player experience in remakes and the original reveals key aspects of world understanding.



Structure of world understanding

■ Based on questionnaire ratings of player experience across a wide range of games, we successfully estimated the underlying structure of how people understand a world.

- Development of questionnaire
- Online-survey
- Factor analysis



Finding 1-1
We identified two independent components: “in-world” and “real-world”.

Finding 1-2
Higher “in-world” and “real-world” ratings lead to higher fidelity.

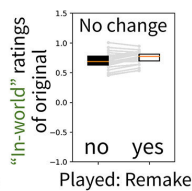
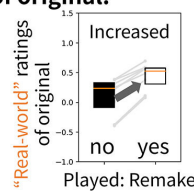
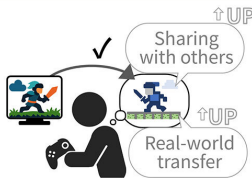
※1 Real-world transfer: Degree to which the experience supports real-world behavior and understanding
※2 Sharing with others: Degree to which the experience can be shared and discussed with others

Updating world understanding

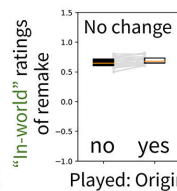
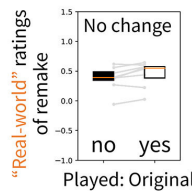
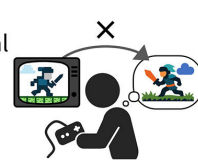
■ Between games set in the same world, how does experience in one affect evaluation of the other?

=For original–remake pairs, does having experience with one work affect evaluation of the other?

Experience with remake increases “real-world” ratings of original.



Experience with original does NOT change ratings of remake.



Finding 2
“Real-world” ratings of previously experienced worlds can be updated through new experiences.

► Evaluation of a world is not fixed but can be reinterpreted afterward.

References

[1] T. Yokosaka, K. Miura, Y. Isogaya, T. Ohtani, K. Maruya, “Factors of player experience in describing the relationship between remade and original works,” 2024 IEEE Conference on Games (CoG), pp. 1–4, 2024.
[2] T. Yokosaka, Y. Isogaya, T. Ohtani, K. Maruya, “Video-Game Retrospective Effect: How Playing Remakes Alters Experience Evaluations for Original Works,” In Companion Proceedings of the Annual Symposium on Computer-Human Interaction in Play, pp. 203–208, 2025.

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