Risk–Benefit Assessment: Embodied VR Study

1. Study Overview

This study explores the psychological and physiological effects of embodying a non-human avatar within a virtual reality (VR) environment. While the anticipated risks are low, the following structured assessment outlines all known and expected risks, their potential severity, and the mitigation strategies designed to address them.

2. Identified Risks and Mitigation Measures

a) Psychological Discomfort

Risk: Participants may experience mild to moderate emotional discomfort, fear, or unease as a result of controlling a spider-like body in VR. These responses may include increased heart rate, muscle tension, or avoidance behavior.

Mitigation: The avatar is deliberately stylized and non-photorealistic to reduce emotional intensity. No jump scares or hostile elements are included. All participants are thoroughly briefed before starting and informed of their right to withdraw at any time. Each exposure is followed by a neutral washout scene designed to reduce lingering discomfort.

b) Motion Sickness and VR-Induced Fatigue

Risk: As with many immersive VR applications, some users may experience symptoms such as nausea, dizziness, or eye strain.

Mitigation: The VR environment has been optimized for user comfort through the use of low-latency hardware, stable frame rates, and limited abrupt camera motion. Participants are encouraged to pause or stop the session if they feel unwell and may discontinue their participation without consequence.

c) Physiological Sensor Irritation

Risk: If a biometric sensor (e.g., heart rate monitor) is used, participants may experience minor physical discomfort or self-consciousness due to the device.

Mitigation: The use of physiological monitoring is entirely optional and requires separate consent. Sensors are non-invasive and can be removed at any time upon request.

d) Technical Errors or Data Privacy Concerns

Risk: As with any digital study, there is a low risk of data loss, misclassification, or unauthorized access.

Mitigation: All data is pseudonymized immediately upon collection and stored on secure institutional servers in accordance with GDPR regulations. No personally identifying information is recorded. Access is limited to the research team.

3. Overall Risk Level

This study qualifies as a minimal-risk investigation. The likelihood and severity of adverse outcomes are low and temporary. No invasive procedures are involved, and no vulnerable populations are targeted.

4. Anticipated Benefits

- Participants gain firsthand insight into their emotional and embodied experiences in VR.

- The study contributes to research in digital embodiment, fear processing, and human-avatar interaction.

- Findings may inform the development of VR tools for exposure-based interventions, clinical support, and digital health innovation.

5. Ethical and Procedural Safeguards

- All participants receive a clear, understandable information sheet and must provide informed consent.

- Participation is fully voluntary and can be ended at any point without explanation or disadvantage.

- A brief verbal debriefing is provided after the experiment to ensure participant well-being.

- No undue pressure, deception, or excessive incentives are involved.

This carefully constructed protocol ensures that potential risks are minimized and ethically justified in light of the expected scientific and societal value of the research.