



Welcome to the less exciting but still essential section of this Study. The following questionnaires focus on capturing your experiences and form the heart of the study. We therefore ask you to complete all Questions honestly and solely based on your personal opinion answer.

Part A: Demographic data

This group of questions is designed to collect essential baseline demographic and general information that will be used to contextualize your responses throughout the study. This will help improve the overall analysis and increase the quality of the results. A definition of immersion: Immersion is a metaphorical term derived from the physical experience of being submerged in water. We seek the same feeling from a psychologically immersive experience that we do from a plunge in the ocean or swimming pool: the sensation of being surrounded by a completely other reality, as different as water is from air, that takes over all of our attention, our whole perceptual apparatus ([20], p.99). *Source: Murray, JH, Hamlet on the holodeck: The future of narrative in cyberspace, MIT press, 2017, page 99* Translation: Immersion is a metaphorical term derived from the physical experience of being submerged in water. We seek the same feeling in a psychologically immersive experience as when we jump into the sea or into a swimming pool: the sensation of being surrounded by a completely different reality, as different as water is from air, which takes over all our attention and perception.

A1. What age group are you in?

- | | |
|----------|--------------------------|
| 18 to 24 | <input type="checkbox"/> |
| 25 to 34 | <input type="checkbox"/> |
| 35 to 44 | <input type="checkbox"/> |
| 45 to 54 | <input type="checkbox"/> |
| 55 to 64 | <input type="checkbox"/> |
| 65+ | <input type="checkbox"/> |

A2. Which gender identity do you identify with?

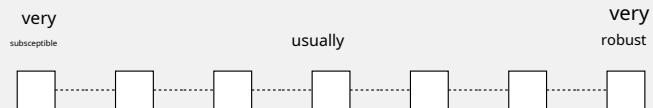
- | | |
|-----------------------|--------------------------|
| female | <input type="checkbox"/> |
| masculine | <input type="checkbox"/> |
| diverse | <input type="checkbox"/> |
| without specification | <input type="checkbox"/> |

A3. Do you have to remove your glasses to wear the VR headset and will this result in impaired vision during the study?

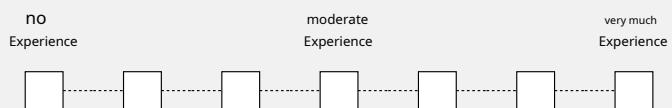
- | | |
|-----|--------------------------|
| Yes | <input type="checkbox"/> |
| No | <input type="checkbox"/> |



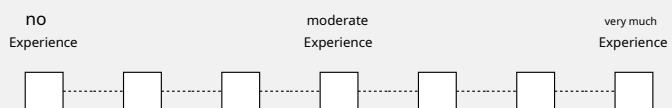
A4. How susceptible are you to exercise-induced nausea, such as driving sickness?



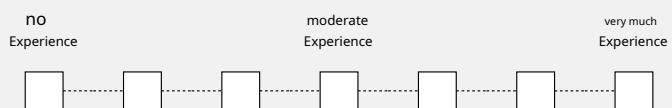
A5. How would you rate your experience with video games?



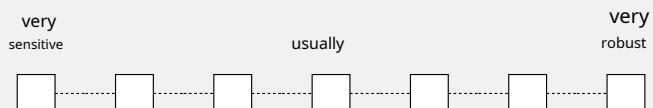
A6. How would you rate your experience with virtual reality?



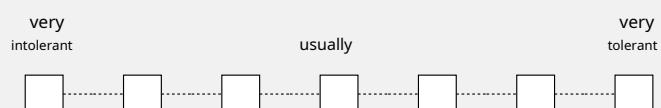
A7. How would you rate your experience with EMS technology (Electrical Muscle Stimulation)?



A8. How would you rate your individual sensitivity to pain?



A9. How would you rate your individual pain tolerance?



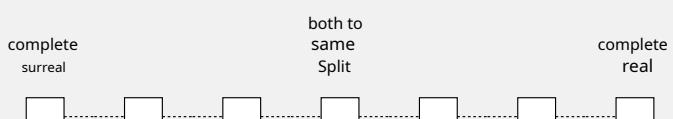
Part B: Examination of your experience without pain component

This questionnaire is completed after the first experience without pain stimulation and is used to measure immersion, sense of presence and sense of realism. It integrates elements from several established immersion questionnaires, including the *group Presence Questionnaire*(IPQ), the *Slater-Usoh-Steed questionnaire*as well as the questionnaires from *Witmer & Singer(1994)* and *Hendrix(1994)*.

B1. How often have you had the feeling of being surrounded by the virtual world?

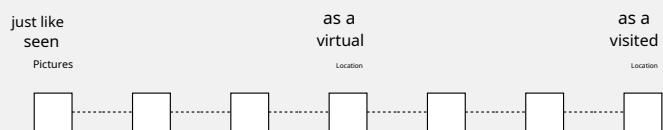


B2. How realistic did your experience in the virtual environment seem?





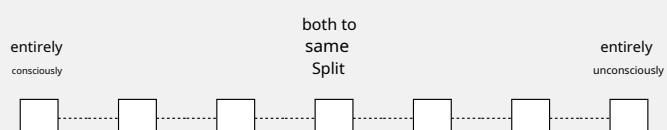
B3. When you reflect back on the experience, to what extent do you consider the virtual environment as a place you visited, as opposed to just seeing images?



B4. How often during your experience did you have the impression that you were actually present in the virtual environment?



B5. How aware were you of the real world around you while moving in the virtual world (e.g., sounds, room temperature, other people, etc.)?



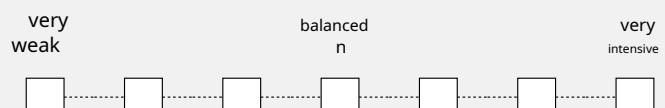
B6. To what extent have you forgotten to pay attention to your real surroundings?



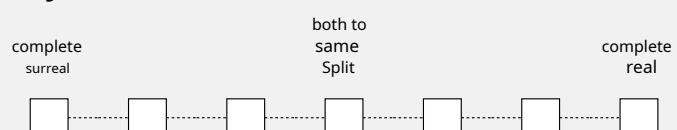
B7. How often have you had the feeling of perceiving images instead of being physically present in the room?



B8. How intense did you feel your connection to the virtual world?



B9. How authentic or realistic did you find the virtual world?

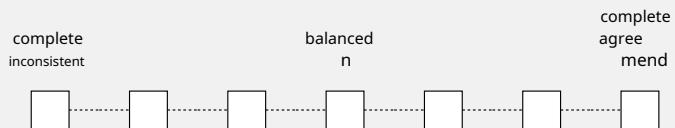


B10. How often have you had the feeling that you were acting in virtual space instead of controlling something externally?





B11. To what extent did your experience in the virtual environment seem to correspond to the real world?



B12. How often have you felt present in virtual space?



Part C: Examination of your experience using a moderate pain component

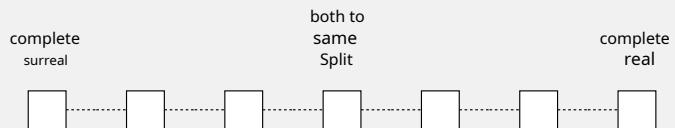
This questionnaire is administered after the second VR experience, which was conducted with moderate pain stimulation. It expands on the previous questionnaire by including questions specifically targeted at the experience of simulated pain.

C1. Please provide the overall average value of your moderate calibration calculated from the average values of the sporadic, intermittent and continuous calibrations.

C2. How often have you had the feeling of being surrounded by the virtual world?



C3. How realistic did your experience in the virtual environment seem?



C4. When you reflect back on the experience, to what extent do you consider the virtual environment as a place you visited, as opposed to just seeing images?

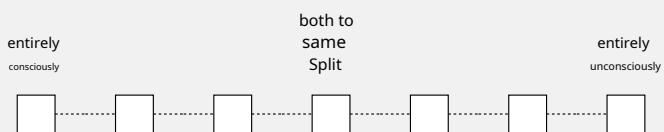


C5. How often during your experience did you have the impression that you were actually present in the virtual environment?





C6. How aware were you of the real world around you while moving in the virtual world (e.g., sounds, room temperature, other people, etc.)?



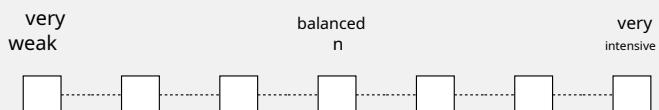
C7. To what extent have you forgotten to pay attention to your real surroundings?



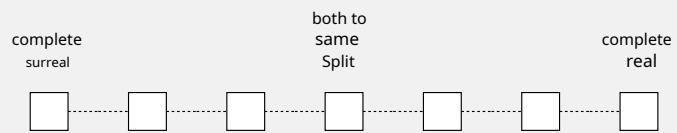
C8. How often have you had the feeling of perceiving images instead of being physically present in the room?



C9. How intense did you feel your connection to the virtual world?



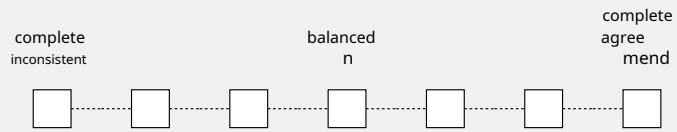
C10. How authentic or realistic did you find the virtual world?



C11. How often have you had the feeling that you were acting in virtual space instead of controlling something externally?



C12. To what extent did your experience in the virtual environment seem to correspond to the real world?

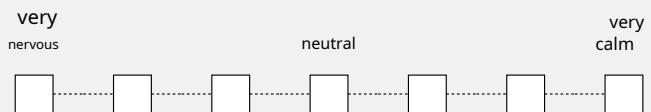


C13. How often have you felt present in virtual space?

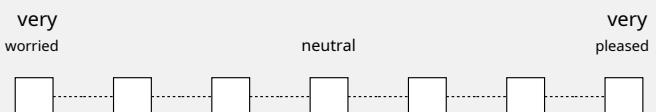




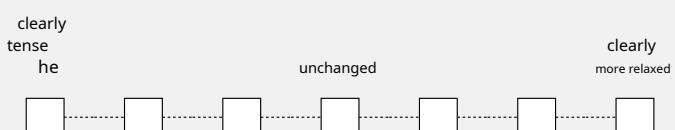
C14. How nervous were you about the upcoming experience?



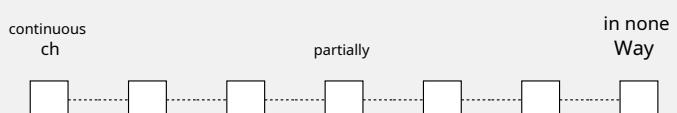
C15. How excited were you about the upcoming experience?



C16. How did your level of relaxation develop during the experience?



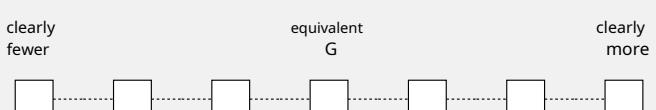
C17. To what extent did you experience emotional pressure during the experience?



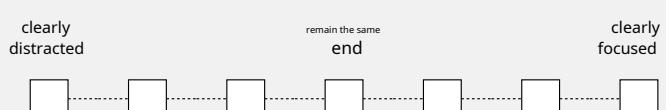
C18. At any point during the experience, did you feel the urge to quit the game to avoid possible pain?



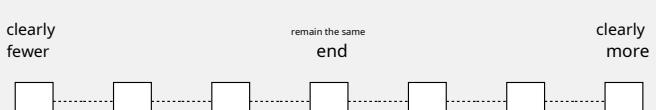
C19. How much more immersive did you find the experience compared to the experience without the pain component?



C20. How much has your focus increased compared to the experience without the pain component?

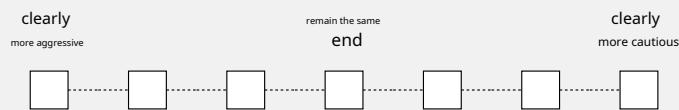


C21. To what extent has your focus shifted to avoiding harm compared to the experience without pain component?

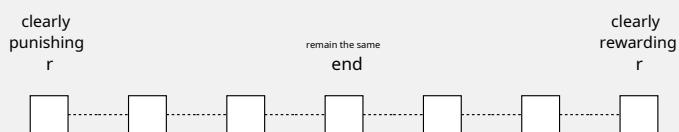




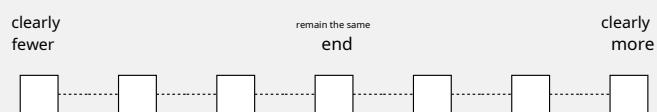
C22. How has your playing behavior changed compared to the experience without the pain component?



C23. To what extent did you find the experience of success more rewarding than the experience without any pain component?



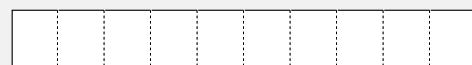
C24. How much do you prefer this experience compared to the experience without the pain component?



Part D: Examination of your experience using a maximum pain component

After completing the third and final VR experience, this questionnaire is completed. It includes all components of the second questionnaire plus supplementary questions aimed at comparing the perception of maximally calibrated pain with the previous perception of moderately calibrated pain.

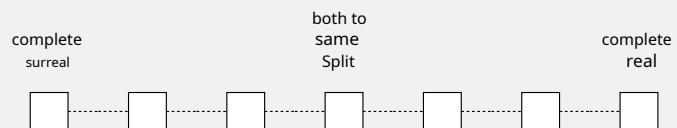
D1. Please provide the overall average of your maximum calibration calculated from the averages of the sporadic, intermittent and continuous calibrations.



D2. How often have you had the feeling of being surrounded by the virtual world?



D3. How realistic did your experience in the virtual environment seem?



D4. When you reflect back on the experience, to what extent do you consider the virtual environment as a place you visited, as opposed to just seeing images?





D5. How often during your experience did you have the impression that you were actually present in the virtual environment?

D6. How aware were you of the real world around you while moving in the virtual world (e.g., sounds, room temperature, other people, etc.)?

A horizontal scale diagram illustrating the spectrum of consciousness. It features two vertical bars at the ends labeled "entirely consciously" on the left and "entirely unconsciously" on the right. In the center, the word "Split" is written above a dashed horizontal line. Below this line, there are six vertical bars of equal height, evenly spaced along the scale.

D7. To what extent have you forgotten to pay attention to your real surroundings?

D8. How often have you had the feeling of perceiving images instead of being physically present in the room?

A horizontal scale representing frequency. It features two arrows at the ends labeled "always" on the left and "never" on the right. In the center is a box labeled "sometimes". A dashed horizontal line extends from the "sometimes" box across the scale.

D9. How intense did you feel your connection to the virtual world?

A horizontal scale representing intensity or strength. It features two labels at the ends: "very weak" on the left and "very intensive" on the right. In the center, between the two ends, is the word "balanced". Below the scale, there are six rectangular boxes arranged horizontally. Each box contains the letter "n". A dashed horizontal line extends from the top of each box down to the scale, indicating a midpoint position.

D10. How authentic or realistic did you find the virtual world?

A horizontal axis with seven vertical bars representing stages of completion. The first bar is labeled "complete surreal" and the last bar is labeled "complete real". Between them are five bars labeled "both to same Split".

D11. How often have you had the feeling that you were acting in virtual space instead of controlling something externally?

A horizontal scale representing frequency or intensity. It features five rectangular bars of equal width. The first bar is labeled "never" at its left end. The last bar is labeled "always" at its right end. Between the first and last bars are three more bars, each centered under a vertical dashed line. The middle bar is labeled "sometimes" at its center. The entire scale is set against a light gray background.

D12. To what extent did your experience in the virtual environment seem to correspond to the real world?

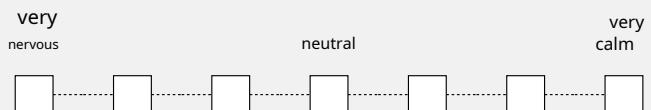
complete inconsistent		balanced n		complete agree mend
<input type="checkbox"/>				



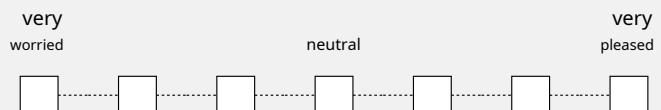
D13. How often have you felt present in virtual space?



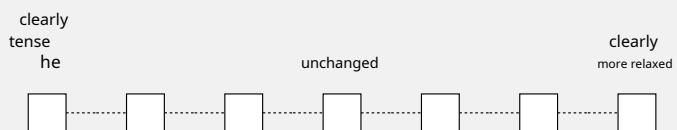
D14. How nervous were you about the upcoming experience?



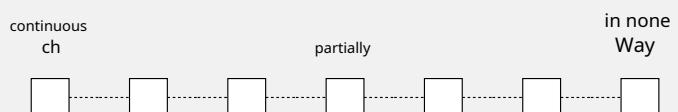
D15. How excited were you about the upcoming experience?



D16. How did your level of relaxation develop during the experience?



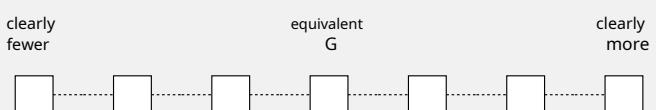
D17. To what extent did you experience emotional pressure during the experience?



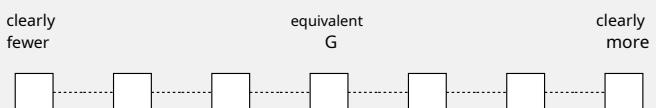
D18. At any point during the experience, did you feel the urge to quit the game to avoid possible pain?



D19. How much more immersive did you find the experience compared to the experience without the pain component?

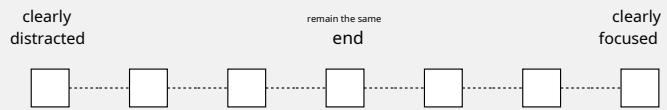


D20. How much more immersive did you find the experience compared to the experience using a moderate pain component?

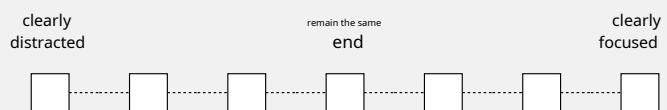




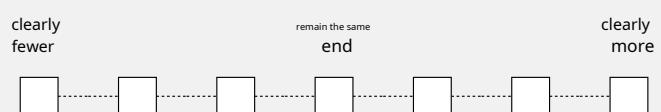
D21. How much has your focus increased compared to the experience without the pain component?



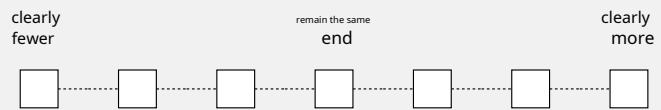
D22. How much did your focus increase compared to the experience using a moderate pain component?



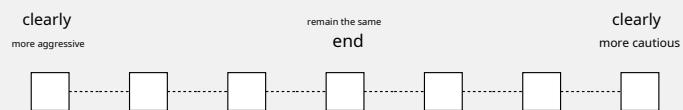
D23. To what extent has your focus shifted to avoiding harm compared to the experience without pain component?



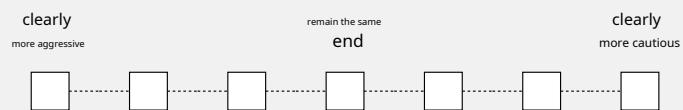
D24. How has your focus shifted to avoiding harm compared to the experience using a moderate pain component?



D25. How has your playing behavior changed compared to the experience without the pain component?



D26. How has your playing behavior changed compared to the experience using a moderate pain component?

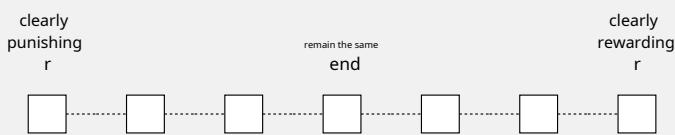


D27. To what extent did you find the experience of success more rewarding than the experience without any pain component?

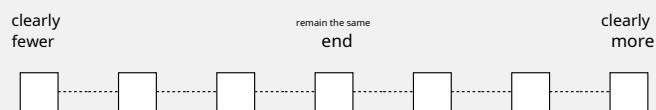




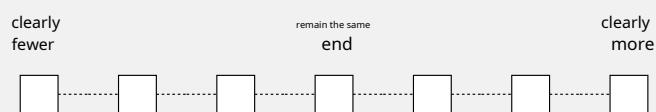
D28. To what extent did you find the experience of success more rewarding compared to the experience using a moderate pain component?



D29. How much do you prefer this experience compared to the experience without the pain component?



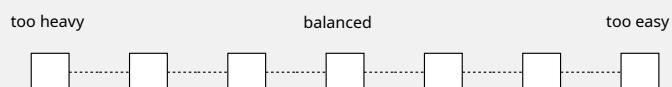
D30. How much do you prefer this experience compared to the experience using a moderate pain component?



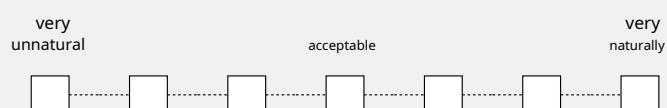
Part E:Final Examination of Your Experiential Insights

This final questionnaire is administered immediately after the fourth questionnaire. Its purpose is to collect general feedback on all VR experiences and to get your opinions on pain simulation and its impact. The focus is on final thoughts, general impressions of the VR experiences and the perceived potential of pain simulation in different contexts.

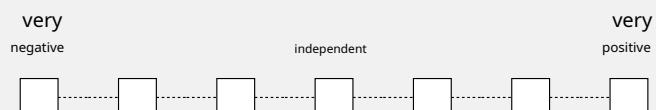
E1. How would you rate the difficulty level of the game?



E2. How did you feel about the level of control you had over your virtual avatar?



E3. To what extent did the difficulty level of the game influence your perception of the pain component?



E4. Which experience gave you the most joy?

- the experience without pain component
- the experience using a moderate pain component
- the experience of using a strong pain component


E5. Choose the experience that gave you the least joy.

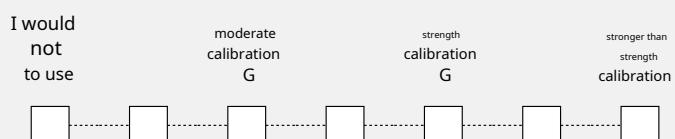
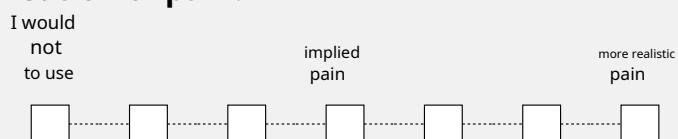
- the experience without pain component
- the experience using a moderate pain component
- the experience of using a strong pain component

E6. Which experience was the most immersive or immersive for you in the virtual world?

- the experience without pain component
- the experience using a moderate pain component
- the experience of using a strong pain component

E7. Which experience did you find to be the least immersive or the least effective in transporting you into the virtual world?

- the experience without pain component
- the experience using a moderate pain component
- the experience of using a strong pain component

E8. At what strength would you use the pain component again if given the opportunity?

E9. If you were given the opportunity to realistically experience the sensation of pain of your avatar in video games (assuming no external devices were necessary), would you take advantage of this opportunity and to what degree would you prefer the realism of the sensation of pain?

E10. Putting on the pain component (here the jacket) is quite time-consuming. How often would you go through this effort for the resulting experience?




E11. What would be the application of the pain component at least comparable so that you would be willing to make the effort to create it more often? Assume that the functionality does not change.

- | | |
|--------------------------------------|--------------------------|
| under no circumstances | <input type="checkbox"/> |
| can be worn like a normal jacket | <input type="checkbox"/> |
| put on like a pair of gloves | <input type="checkbox"/> |
| wearable like a bracelet | <input type="checkbox"/> |
| activated by a device in your pocket | <input type="checkbox"/> |
| activated by sheer willpower | <input type="checkbox"/> |

E12. What additional skills would the pain component at least so that you would be willing to make the effort to put it on more often? Assume that the degree of pain remains adjustable in any case.

(Multiple answers are possible.)

- | | |
|--|--------------------------|
| under no circumstances | <input type="checkbox"/> |
| produce sensations in the upper extremities | <input type="checkbox"/> |
| produce sensations in the lower extremities | <input type="checkbox"/> |
| Create sensations throughout the entire body | <input type="checkbox"/> |
| simulate a more immersive spectrum of pain types | <input type="checkbox"/> |

E13. How do you rate the length of the experiences, regardless of the length of the questionnaires?

- | | |
|-----------|--------------------------|
| too long | <input type="checkbox"/> |
| precisely | <input type="checkbox"/> |
| too short | <input type="checkbox"/> |