

Finding and Unifying definitions of Immersion.

John Dawson

j.d.dawson@ncl.ac.uk

Peter Andras Group

Presentation Outline

- ❖ Background
- ❖ Examples of Immersion
- ❖ Understanding Immersion
- ❖ Current Work

Background

- Term “immersion” to describe engagement in activities has become increasingly prevalent.
- However the actual definition of immersion has differed greatly between subjects with contention arising over what immersion is, the mechanisms which produce immersion as well as the features that mark an immersive experience.

Background: Competing Definitions

- Immersion as a feeling of engagement with make-believe worlds (Coomans and Timmermans 1997).
- Immersion as emotional response to being in a virtual world (Manetta and Blade 1998).
- Immersion as the abilities of the technologies to give high fidelity experience. (Radford 2000, Slater et al. 1994).

Background: Competing Definitions

- Immersion as “optimal experience” of an activity – Flow Experience (Csikszentmihalyi 1990)
- Immersion as different levels of engagement in an activity (Brown and Cairns 2004)

Background: The Issue of Immersion

- The Issue: What exactly is Immersion, is it a common experience, what factors cause immersion?

Examples of Immersion: VR Systems

VR Systems:

- Emphasis on the fidelity of experience through technology.

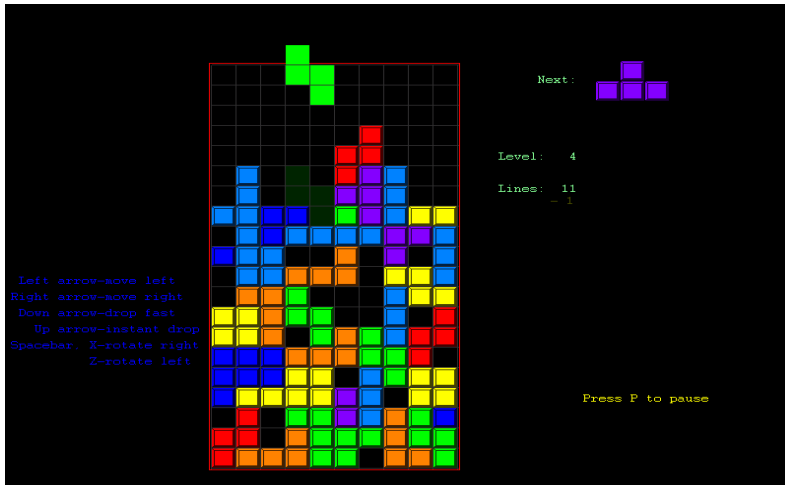


<http://www.virtuix.com/>

<http://www.youtube.com/watch?v=aTtfAQEeAJI>

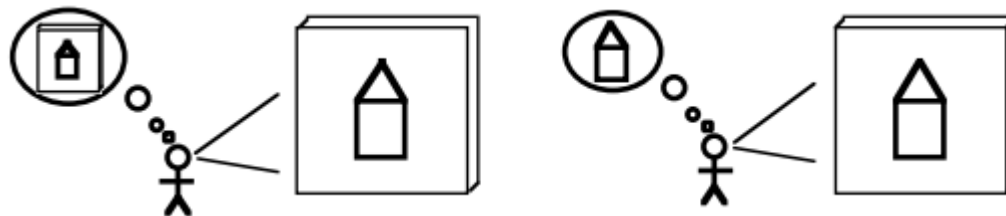
Examples of Immersion: Video Games

- Video Games:
 - Emphasise Immersion through a combination of Interaction between game rules and User
 - Complexity not a necessity nor necessarily beneficial.



Examples of Immersion: Film

- Film – Presence known as the “Diegetic Effect” (Burch 1978, Tan 1996) where the viewer (user) observes the virtual world of the film as an imaginary space.
- Immersion is by increasing familiarity of the environment to the viewer through camera shots, characters and narrative (Self+Presence). Deeper immersion occurring when the user no longer “thinks” they are watching a film (Smith et al. 1998)



Examples of Immersion: Film



Examples of Immersion: Literature

- Literature – “Transportation effect” (Green and Brock 2000, 2002); Spatial metaphor of being “taken away” to the environment of the book.
- Immersion through the focusing of attention on the events occurring in the book rather than the external world.

Examples of Immersion: Art and Stage

- Art – Immersion through style and perspectives (E.g Trompe-L'œil, Frescoes) or through emotional invocation (Grau 1993).
- Stage – Methodology of actors to produce performances (Stanislavski System 1936), Drawing in the audience to be part of the performance. (Agusto Boal 1993)

Examples of Immersion: Art and Stage



Examples of Immersion: Art and Stage



Understanding Immersion: Virtual Environments

- Virtual Environments
 - “Fictitious spaces” in which users engage
 - Illusion of displacement to another location (Ellis 1991)
 - Provide the “context” in which activities can be performed: the “Ruleset” of interactions.

Understanding Immersion: Presence

- The sense of “Being there” in a Virtual-Environment (Witmer and Singer 1994).
- 3 type Model (Heeter 1992)
 - Personal (Presence generated by self)
 - Social (Presence from characters in VE)
 - Environmental (Presence from the reaction of the environment to the user).
- Perceptual Illusion (Lombard and Ditton 1997)
 - The idea presence is when user no longer perceive or acknowledge the VE as being “fake.”

Presence and Immersion

- Presence strongly tied to immersion:
 - Attempts to unify definitions of Immersion/Presence:
 - Representation of Self + Virtual Environment = Immersion into the VE (Slater, Usoh and Steed 1994).

Flow and Immersion

- Immersion seen as a “positive experience” of engagement.
- Emotional enjoyment / engagement a common factor between differing areas of use.
- Documented common experience: Flow (Csikszentmihalyi 1975, 1990, 2002)

What is Flow Experience?

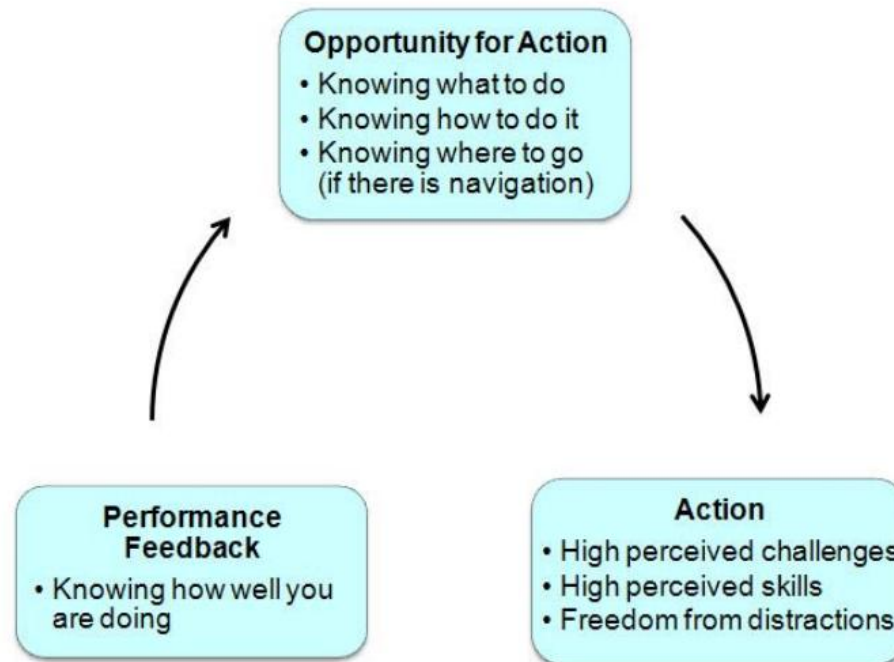
- Mental focusing of attention and motivation to produce positive emotion in the task at hand.
- The more you do the task, the more rewarding it is.
- “Flow...the state in which people are so involved in an activity that nothing else seems to matter, the experience itself is so enjoyable that people do it even at great cost, for the sheer sake of doing it”. (Csikszentmihalyi 1990)

Elements of Flow

- Concentration and focus on the task at hand – Filtering out external elements such as sounds and distractions.
- Action and Awareness - Automation of behaviour to conform to the features of the activity.
- Loss of Self-Reflection – Individual temporarily “forgets” themselves as agents of the real-world to instead take part in the realm of the activity.
- Sense of Control – Feelings of being able to influence and control the activity without fear of repercussions or failure.
- Distortion of perception of the passage of time.
- Intrinsic Reward – Participation in the activity is rewarding.

Conditions of Flow

- Schaffer (2013) Flow-Loops:



Flow loop model with flow conditions

Flow and Immersion

- Immersion as the facilitator of flow experience?
- Immersion as a precursor to flow?
 - Focus and attention into the task leading to flow loops.

Current Work

- Does Representation of Self + Virtual Environment + Flow Loops = Immersion?
- Currently looking at Video Games as example.
- Chosen as Video Games provide a flexible medium over others.

Current Work

- Highlighting common features between definitions to give structure to immersion.
- Immersive experiences composed of discussed elements:
 - Virtual Environments
 - Presence (Self-Reflection)
 - Focus of Attention (Investment of mental energy)
 - Fulfilling Goals and Objectives (Control of VE)
 - Perceived Challenge; Learning / Development of skills
 - Perceived reward / Positive experience (Flow Loops)
 - Time perception distortion

Current Work

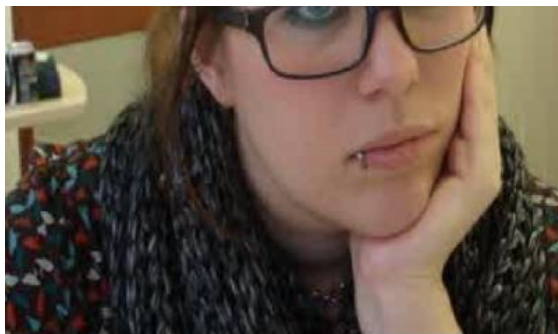
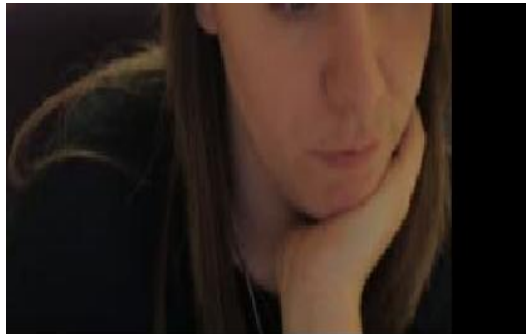
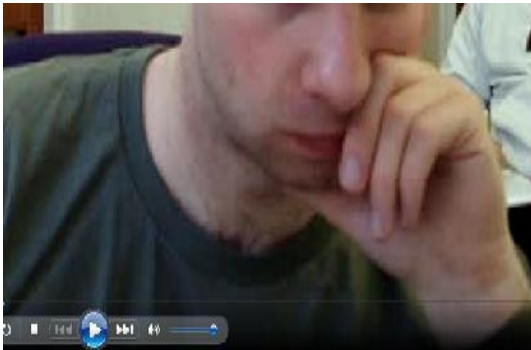
- Present ongoing study
 - Users play 2 games and rate experience using existing Flow/Immersion measuring questionnaires (Schaffer 2013, Jeanette et al. 2006)
 - Additional information to be gleamed through Ethnographic methods of collection (participant observation, video coding and 1-1 interviews)

Current Work

- Data currently under analysis but initial observations:
 - Definite link between Presence + VE + Flow Loops when describing “Immersion”
 - Time Distortion linked to strength of immersion experience. The more distorted perception correlates to greater reported levels of immersion.

Current Work

- A “common body language” of immersion?:



Future Work

- Analysis of video
- Ethnographic coding of additional body language and behaviours during game play
- Presenting an “Immersion framework” in which to unite the different definitions and aspects of immersion together.

Interested in Participation?

- Participants wanted for current ongoing study.
- Contact Email: j.d.dawson@ncl.ac.uk

Thanks and Questions

Q&A

References (By appearance)

- COOMANS, M.K.D. and TIMMERMANS, H.J.P. (1997). Towards a taxonomy of virtual reality user Interfaces. In *The IV '97 Proceedings of the IEEE Conference on Information Visualisation, August 1997, Washington, DC, USA*, pp. 279.
- Manetta, C., & Blade, R.A. (1998). Glossary of Virtual Reality Terminology. *International Journal of Virtual Reality*, <http://ijvr.uccs.edu/manetta.htm>
- Radford A., (2000). Games and Learning about Form in Architecture. *Automation in Construction*, 9, 379– 385.
- SLATER M., USOH, M. and STEED, A. (1994). Depth of Presence in Virtual Environments. *Presence: Teleoperators and Virtual Environments*, 3(2), pp. 130-144.
- CSIKSZENTMIHALYI, M. (1975). *Beyond Boredom and Anxiety*. San Francisco CA: Jossey-Bass.
- CSIKSZENTMIHALYI, M. (1990). *Flow: The Psychology of Optimal Experience*. New York: Harper and Row.
- CSIKSZENTMIHALYI, M. (2002). *Flow: The Classic work on how to achieve happiness* (Rev. Ed.). London: The Random House Group.
- BROWN, E. and CAIRNS, P. (2004). [A grounded investigation of immersion in games](#). In *CHI '04 Extended Abstracts on Human Factors in Computing Systems, April 2004, New York, NY, USA*, pp 1297-1300.

References

- Burch, N. (1979). *To the distant observer*. Berkeley: University of California Press.
- Tan, E. S. (1996). *Emotion and the structure of narrative film. Film as an emotion machine*. Mahwah: Lawrence Erlbaum.
- Smith, S., Marsh, T., Duke, D., Wright, P.: Drowning in immersion. In: Proceedings of UK-VRSIG 1998: UK Virtual Reality Special Interest Group (1998)
- Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology*, 79, 701-721.
- Green, M. C., & Brock, T. C. (in press). In the mind's eye: Transportation-imagery model of narrative persuasion. In M. Green, J. Strange, and T. Brock (Eds.), *Narrative impact: Social and cognitive foundations*. Mahwah: Lawrence Erlbaum.
- ELLIS, S.R. (1994). What are virtual environments? *IEEE Computer Graphics and Applications*, 14 (1), pp.17-22.
- HEETER, C. (1992). Being there: the subjective experience of presence, *Presence: Teleoperators and Virtual Environments*, 1(2), pp. 262-271.
- WITMER, B.G., & SINGER, M. J. (1998). Measuring Presence in Virtual Environments: A Presence Questionnaire. *Presence: Teleoperators and Virtual Environments*, 7(3), pp. 225-240.

References

- LOMBARD, M. and DITTON, T. (1997). At the Heart of It All: The Concept of Presence. *Journal of Computer Mediated Communication*, 3 (2),
- Schaffer, Owen (2013), [Crafting Fun User Experiences: A Method to Facilitate Flow](#), Human Factors International
- JENNETT, C., COX, A., CAIRNS, P., DHOPAREE, S., EPPS, A., TIJS, T. and WALTON, A. (2006). Measuring and defining the experience of immersion in games. *International Journal of Human-Computer Studies*, 66(9), pp. 641-661.