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Play in a Mixed Reality: Alternative Approaches into Game Design

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Introduction

What is a mixed reality? How games provide experiences of alternative realities while players become engaged with them? What kind of roles mobile, location-aware games can have in development of alternative aesthetics of play and alternative approaches into game design?

These are the questions that provide starting points for this chapter where we will discuss the cultural role of mixed reality gaming, and introduce some findings from an experimental game design project carried out by our research team. The chapter aims to bring together theories of play and practices of game design, and to make the nature of digital play more concrete while also discussing future opportunities. The focus of discussion will be on the construction of playful reality through experiences derived from experimental, hybrid reality game design.

From Magic Circle to Frames for Gaming

Research in children's pretence play activities have demonstrated that young children, typically when they reach the age between two to four, are capable of play activities in which imaginative elements and actual elements Children are also capable of referring correctly to the state of the imaginative contents of the cup and actual cup, depending the context. The ability to understand context seems to be fundamental for communication in general. American social-psychologist Erving Goffman argues that people in communication are very sensitive to different context, or frames. Our view is that challenges and potentials of location-aware, mixed reality play are related to such of issues in the communication and framing of the game. Participation in mixed reality play involves ability to maintain and negotiate between multiple frames of reference, all layered within the same situation.

In his seminal work, *Frame Analysis* (1974, 21) Goffman puts forward 'frame' as a concept that denotes schemas of interpretation that help people to "locate, perceive, identify, and label" various phenomena and occurrences in their lives. Frames are thus cognitive structures that make the world meaningful to us in any human, socio-cultural sense. Goffman's approach has been developed further particularly in the contexts of communication studies and studies of social movements. Analysing

operations of media, Todd Gitlin (1980/2003, 6) defines frames as “principles of selection, emphasis, and presentation composed of little tacit theories about what exists, what happens, and what matters”. Students of social movements on the other hand have emphasised how frames render certain events or occurrences meaningful, and thereby “function to organise experience and guide action, whether individual or collective” (Snow, Rochford, & Worden 1986, 464). There is no longer a single unified theory behind these various uses as the frame analysis has been extended and modified to suit different purposes. The core idea of frames nevertheless comes together in the subtitle of Goffman’s original work: frames are central for the organisation of experience, and therefore important also for our discussion of mixed reality games.

For games and play experiences a very particular kind of organisation of experience is being required. Within game studies, a concept introduced in Johan Huizinga’s work *Homo Ludens* (1938/1955) has been established to discuss the boundaries that separate games from the “ordinary life”:

All play moves and has its being within a playground marked off beforehand either materially or ideally, deliberately or as a matter of course. [...] The arena, the card-table, the magic circle, the temple, the stage, the screen, the tennis court, the court of justice, etc., are all in form and function play-grounds, i.e. forbidden spots, isolated, hedged around, hallowed, within which special rules obtain. All are temporary worlds within the ordinary world, dedicated to the performance of an act apart. (Ibid., 10.)

Katie Salen and Eric Zimmerman have been influential in promoting ‘magic circle’ as a general concept for this separate quality of play. In their book *Rules of Play* (2004) they consider how some games have a physically marked area like game board or playing field, but in many games there are no such physical boundaries, yet the decision to start playing creates a (metaphorical) magic circle where something very special happens.

Within the magic circle, special meanings accrue and cluster around objects and behaviours. In effect, a new reality is created, defined by the rules of the game and inhabited by its players. Before a game of Chutes and Ladders starts, it’s just a board, some plastic pieces, and a die. But once the game begins, everything changes. Suddenly, the materials represent something quite special. This plastic token is *you*. These rules tell you how to roll the die and move. Suddenly, it matters very much which plastic token reaches the end first. (Ibid., 96.)

The concept of magic circle has been useful for pointing out the qualitative changes that entering game play state carries with it, but as a spatial metaphor, magic circle also easily leads one to study games in isolation – a tendency of game studies reinforced by its focus on computer and video games that are apparently clearly demarcated by the frames of their visual display. In reality, games and play are not limited within any precisely definable borders. Moreover, Salen and Zimmerman (ibid.) note that only by equating a game with its rules, and by approaching it as a formal, mathematical system it becomes closed from game-external influences. Whenever actual players are involved, also their social relations, likes and dislikes and their various expectations enter the play. Games that are played in the real world are also embedded in the various social and cultural systems that the surrounding society is built on. However, certain kind of filtering of information takes place during play. In his essay “Fun in Games”, Goffman argued that the “barrier” that game playing represents to the “properties from the outside world” is “more like a

screen than like a solid wall” and that this screen-like boundary “not only selects but also transforms and modifies what is passed through it” (Goffman 1961, 33; cf., Nieuwdorp 2005). The worlds of “gaming realities” and “everyday realities” thereby appear to be separated by some kind of semi-permeable membrane, rather than by any definite wall or boundary.

The traditional board and card games exemplify well how games and social situations are superimposed within each other. For example, when *Bridge* is played as leisure, the strict communication rule (that a *Bridge* player can only use certain words) is changed so that it is possible to discuss topics that do not relate to the hand that is being played; this means that each player needs to be aware of and carefully keep separate the different frames of reference while speaking during the game. Traditional games offer mostly rather clear markers that can help people to identify and enter the “gaming frame” (e.g., a game field and a football, a deck of cards and a game board).

One important theory concerning the maintenance of gaming frame was developed by anthropologist Gregory Bateson. Bateson (1955/1972, 184) studied play-fighting among animals and concluded that there has to be a way among them to communicate when a bite is meant for play, and when it is for real. He called this metacommunication; for example, a bite can be carried out in a particular manner so that it becomes “nip” rather than a real bite. There can be also other signals that convey to the other animal the meaning that this time biting is meant as something fun rather than threatening. Thus, metacommunication is that part of interaction or communicative actions that deals with how these actions should be interpreted – communication about the (nature of) communication. Ability to read such cues on the willingness of each player to engage in game is part of the “social games literacy” required for gameplay to be enjoyable. A player who is forced to play, is not acting within the proper gaming frame, and most probably while not enjoying the experience himself, is also more likely to ruin the game for others. Like Huizinga writes (1938/1955, 7), all play is voluntary activity and “play to order is no longer play”, but at best an imitation of play. Information about the boundaries of play is therefore needed in order to maintain and negotiate the continuity of game state – and to know when (and where) the game is over. An alternative to the concept of metacommunication would be to speak about “gaming contract” as a particular, mostly implicit social contract that players enter when they all agree upon being participants in a game (cf. e.g. Binmore 1994; 1998).

Psychologist Michal Apter (1989/2007, 41) has written how engagement in games creates sort of “psychological bubble” what he calls *paratelic* state; rather than setting external goals to motivate activity (as in *telic* state), person in paratelic state perceives the activity as having its goals and meanings in itself. Apter’s work is also useful in providing perspective to the motivational factors driving people towards the excitement that games are able to provide. His theory suggests that the presence of (real or imaginary) danger or challenge can lead to high arousal state, which can experienced both negatively as anxiety, or positively as excitement. Apter (1992, 26-28; 2007, 29-32) proposes that the existence of a “protective frame” is required for participants in various “extreme” sports and such forms of entertainment to enjoy their closeness to danger as pleasurable excitement (c.f., Lankoski 2007). It can be suggested that mixed reality games are based on a similar mechanism of framing, where certain parts of the “real life” are conceptualised and experienced as parts of

the protective “game frame” and thereby as sources of ludic entertainment, rather than just evoking their commonplace reactions.

Enjoying the Ambiguity of Overlapping Realities

When one is playing location-based games, markers for the gaming frame are often ambiguous and not clear. How does this influence the flow of information, and hence the aesthetics of location-based games? We will next focus on this flow and framing of information, approaching it also from the alternative perspective; what we can learn about traditional games by looking the ambiguous framing that is a key feature having an effect on the aesthetics of location-based games.

Interestingly, similar ambiguity than what takes place in location-based games is a feature of children’s play. Yet, children seem to be very good to judge when another is playing and, also, able to participate in co-operative play. Alan Leslie (1994) has demonstrated this with an example of mother holding a banana like a phone and talking to it. Even a very young child (typically not younger than 12 to 24 months) would suppose that the mother is pretending that the banana is phone. Leslie describes an experiment in which an adult pretends to fill cups, and then turns some cups briefly upside down, after which a cup is placed back with other cups. Children (26 to 36 months old) were very good to discriminate, which cups are empty and which full in this pretence play – despite all cups being actually empty. (Leslie 1994.) Other studies on children’s pretence play suggest also that pretending and judging that someone is pretending are fundamental human abilities (e.g., Lillard, 1993; Nichols & Stich, 2003; Sobel, 2004).

Table-top role-playing games constitute a complex form of pretence play. While it is usually obvious to outsiders when a game is taking place through different visible markers, the players need to be aware of contexts and situate actions to suitable context in order to understand other players. Gary Allan Fine (1983) points out that in role-playing games there are multiple frames of reference, which include primary framework, game context, and the character/player context; the last means that the player can speak as the character or speak about the character. An action can have meaning in all of these frames or relate to only some: some actions relate directly to the game and character context (such as player speaking as the character), some relate indirectly through the use of game system (throwing a dice, describing the action of the character), or some actions do not relate to the game frame at all (e.g., discussion about when to eat). Obfuscating the frame of reference can be used to make a joke among players. In these cases, understanding the joke requires understanding the ambiguity of reference.¹ (Ibid.)

Many mixed-reality games obfuscate (intentionally or unintentionally) markers that can be used to infer whether one is playing a game. The experimental location-aware mixed-reality game implemented in our research, *The Songs of North* (c.f., Ekman et al., 2005; Lankoski et al., 2004), was designed so that one could play the game only by listening what is happening in the game world using headphones. When the game events required a more active mode of playing, quickly taking out a mobile phone and

¹ Live-action role-playing games are, in this sense, similar. (See, e.g., Brenne, 2005.)

pushing a few buttons was enough. No exact awareness of the location of other players, for example, was required, and the gaming interface was designed to provide ambient, rather than precise information of the game state to the players. This ambiguity in *The Songs of North* was intentional and related with other design choices.

The player-centred design research process which led to the formulation of principles guiding this game design has been described in detail elsewhere (Ermi & Mäyrä 2005). The key element was to engage “real users” with the design process as early as possible. The reactions of players towards mixed reality gaming were probed in interviews and particularly illustrated scenarios about potential future game implementations were helpful in provoking reactions among our informants. Since no narrative or play scenario is substitute for actual, interactive play experiences in real life contexts, it is important to use care while interpreting the results from such early phases of player studies. In our case, tentative design guidelines were produced that could then be further tested with an actual mixed reality game prototype. These included mixed reality playability guidelines such as:

- ensure that movement will not become too much of a burden to the players,
- allow different modes of gameplay and support various player types,
- allow as much free communication between the players as possible,
- design the interface so that it requires only a minimum amount of handling of the device and pressing of the buttons,
- integrate some aspects of the game world with the real environment. (Ibid.)

The last guideline was particularly important to guide the design of our mixed reality game; there should be interconnections between the fictional game world and the physical, everyday player environment. After analysing our findings, a “three world model” for mixed reality gaming was developed (see Figure 1 below). Players moving between different frames have the flexibility of gaining different information while in different play modes. The player in the left is moving while being logged into his game client, and thereby his avatar (spirit world representation) is able to interact with the entities inhabiting the fictional game world. On the other hand, a player in the right is making a phone call to another player, thereby making use of the game system but on player-to-player level. The “mixed world” of play includes information from both other layers of gaming reality, to the degree these various aspects contribute to the mixed reality gameplay and gaming experience. Processing the results from the player studies in the form of guidelines or design requirements was important for the design phase. The abstraction of the results provided concrete goals for design without handicapping the design with too concrete preferences and prejudices of the informants participating in the concept phase player study.

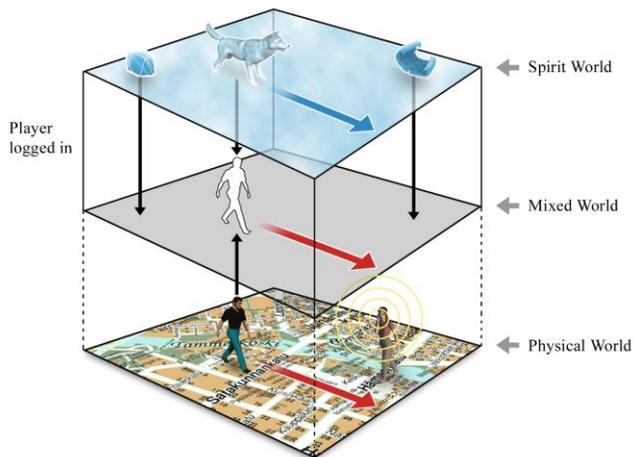


Figure 1: Model showing how the three layers of gaming reality are mapped in relation to each other: the gaming fiction (“Spirit World”) and the everyday physical environment (“Physical World”) interact to produce the “Mixed World” of players’ experience. (Lankoski *et al.* 2004.)

Also certain player control and security guidelines were derived from the player study, including: “enable the players to control when they play and thus make it possible for them to separate the gameplay and real life” and “ensure players’ security and give them the possibility to stay anonymous to other players”. (Ibid.) These were derived from the caution many of our informants expressed when they were faced with a gaming concept that had potential to extend everywhere in their lives, and which included positioning of players while their game client was on, even if they were not actively engaged in gameplay during the moment. In the actual play-testing done with *The Songs of North* prototype game, no such concerns over controlling the game-reality boundary or about the threats to their anonymity were expressed any more. The actual experience of playing a mixed reality game quickly built up players’ confidence about their ability to manage the gaming frame even while moving around in their everyday affairs.

After the scenario studies and play tests with the prototype game, certain key conclusions about mixed reality gaming were confirmed. The primary among them was our conclusion that when one is playing through physical movement in a city, it is problematic if the game requires focused attention all the time, and therefore ambient sounds, or other ambient (e.g., haptic) information should be used to deliver messages from the game world. We also believe that ambient cues such as sounds have potential to provide even stronger sense of presence and stimulate imaginative immersion in the game world than the use of limited visuals delivered by a small screen of a hand-held device. In terms of technology, our experiences underline the importance of using common and familiar devices such as regular mobile phones, rather than forcing players to carry on any additional, special hardware while they are playing and moving around in their daily lives.

Based on these experiments and experiences with location-aware and pervasive games, it becomes clear that the ambiguity of frames has special role in the design and analysis of these kinds of games. These games rely on our inherent ability to maintain the “factual” and “pretended” reality on top of each other, and to our capacity to negotiate between them. The role of audiovisual or simulated game world for mixed reality games is next taken under closer scrutiny.

Fallacies of Immersion

Most design approaches are based on the premise that the main goal for gameplay experience is (total) immersion to a game. While this is commonly held view in video games design, and also regularly reflected in game design literature (see e.g., Bateman, 2007; Rouse, 2005), mostly the exact nature of this immersion is not being defined or studied. In an earlier study by Laura Ermi and Frans Mäyrä, an attempt to analyse immersive aspects of player experiences was made, and three distinct components of gameplay immersion were identified: sensory immersion, challenge-based immersion and imaginative immersion² (Ermi & Mäyrä 2007). Powerful, engaging game experiences of different kinds can be provided by taking into account the full range of immersive potentials this model provides – e.g., a powerfully immersive game does not necessarily require audiovisual interface of any kind. Salen and Zimmerman (2004, 450) have named as “immersive fallacy” the idea that “pleasure of media experience lies in its ability to sensually transport the participant into an illusory, simulated reality”. In the light of the immersion model by Ermi and Mäyrä (2007), Salen and Zimmerman are actually criticising games industry of focusing only on one aspect of immersion, the one that is defined by sensorial focus of engagement. Immersion into playful challenges, or into the fiction of games by application of imagination is useful in highlighting the active role that players need to invest into play in order to become engaged with a game. This kind of gameplay immersion cannot be created through offerings of advanced video, and audio spectacles – even if spectacular graphics are likely to capture gamers’ initial attention. Notably, a game or puzzle can intrigue or engage its players very long, for example, until the crossword puzzle is solved. However, it might be problematic to claim that they were strongly immersed to the game or puzzle. Many of so-called casual games and players favouring these kinds of games are not particularly immersion-focused, and various social and other contexts, extending outside of the game itself, are having a central role for games played in this, non-absorbed manner (Mäyrä 2007).

Any comprehensive understanding of game experiences cannot be based on audiovisual or sensory dimensions of media alone, and particularly true this is in the context of mixed reality games. The main design goal of mixed-reality game can be, for example, to change players’ attitudes towards their everyday environments. This goal might be require players’ heightened awareness of their surroundings and is thus the opposite to a device-centric view on immersion; such alternative game aesthetics, nevertheless, can produce games that are interesting to play. One example of this kind of approach is the game *Visby Under* (c.f., Interactive Institute 2002). In this experimental game, players are encouraged to explore the contemporary and historical city of Visby, real locations mixing with old Swedish myths. The game is also designed to be adaptive, as players can approach the game with different playing modes depending on whether they are more interested in a challenge-based gameplay or in exploring the city. This kind of games (such as *The Songs of North*) requires thinking design and aesthetics of games from a novel perspective. Exploring an alternative point of view like this can also deepen our understanding of game design and the limits of aesthetics dominating the current generation of PC and console

² Immersion as discussed in Ermi & Mäyrä 2007, and as applied here, is based on a synthesis of various research traditions and player experience data, and should not be confused with the way immersion concept has been used e.g. by Janet Murray (1997).

games. In general, the design method should be chosen to support the design goals. We should not forget that above-mentioned methods for PC and console games seeking strong sense of presence have their uses, but there is also a need for different methods for highlighting different aspects of game and gameplay design (Lankoski & Björk 2007).

Conclusion: Altering Our Realities through Gaming

The contemporary context of digital play and games is rapidly changing. On the other hand, there still appears to be a “digital games divide” between very strongly games-oriented younger generations, and those, middle-aged and older people who have not found contemporary computer, video or mobile games to suit their preferences. Yet, the study (Kallio, Kaipainen & Mäyrä 2007) that identified the unequal distribution of digital gaming among people of different ages, also calculated the average age of “digital gamer” to be 37 years. Gamers are getting older, and becoming more and more like the general population in average. On the other hand, looking at changing media landscape more generally, media scholar Henry Jenkins (2006) has pointed how the “participatory media culture” is no longer sole property of active gamers or active science fiction fans, but a general, built-in expectation of interactive engagement with a world that largely consists of media contents, contributing to the development of a wider “convergence culture”. In another article (Stenros, Montola & Mäyrä 2007) an argument has been made for the “ludic society”: the increasingly visible and pervasive character of playful and game-like practices and cultural forms pervading the present and future of “information society”, “media society”, or “experience society”, as this social configuration has been variously called.

Exaggerating a bit, it is easy to point out the limitations of traditional video games for this kind of wider societal change. Rather than taking place in public sphere or being inherently collaborative by nature, traditional video gaming situation is subject to the restrictions of personal computer: a single-user computing device that only rather recently was able to connect and communicate with other similar devices. With the exception of such recent inventions as dance pad used in *Dance Dance Revolution* or Nintendo Wii, the interactions allowed in digital gaming have been limited to series of rather cryptic key-press combinations or the uses of special hardware add-ons such as driving wheels or flight sticks. Mixed reality gaming has potential to bring games back to public spaces, as it represents a paradigm shift in the way of thinking about digital gaming and game design. Mixed reality gaming can break away from the isolated locations such as private homes and offices into environments where people naturally move about and interact. When based on human movement and gesture, mixed reality games can also be designed to take advantage of existing human skills, rather than forcing players to learn new ones before being able to interact with the game world. Also, the mixed reality aesthetics is not based on a virtual reality that is designed to block away players’ real surroundings; rather, mixed reality is providing us with possibilities of interacting with and within our real surroundings in new ways. The core element for this development to become true, is to design games for players’ creativity and interaction with their environments in mind, rather than attempting to design “complete” and closed game worlds.

To give one concrete example, game designer and researcher Jane McGonigal has been active in the field known as Alternate Reality Games (ARGs), which overlap both mixed reality games and pervasive games (as discussed by, e.g., Montola 2005). McGonigal (2003) draws upon inspiring examples to describe the “immersive aesthetics” of ARGs which relied primarily on fabricated Internet web sites to build up the diegetic (fictional, in-game) version of reality. The immersiveness McGonigal describes is partly due to the extensive web of interrelations these game designs involved, and partly on the way these games were based on the use of cross-medial and trans-medial techniques of involving players, including fake phone calls, fax messages, television, and newspaper advertisements as well as a few real-time, staged events in the “real world”. McGonigal emphasises that none of “virtual play” taking place in an ARG was “simulated”: it was not taking place in an enclosed, virtual environment but in the media-saturated “real life” of its players. In terms of the distinctions presented above, an ARG does not primarily rely on sensory immersion to inspire players, but rather emphasises the challenge-based and imaginative dimensions of gameplay immersion.

The collective nature of “gaming contract” or metacommunication that organises player action is perhaps the single most important element in this particular form of alternative game aesthetics. For example, a group of players of an ARG known as “The Beast” organised their joint efforts in problem-solving into a web-based community titled “Cloudmakers”, consisting of over seven thousand members. Growing exceedingly efficient in their operation, this collective serves also as an example of digital networking tools integrating player thought and action to a degree where it makes sense to talk about “emergent” phenomena – in the sense an ant colony, for example, performs at the collective level like an efficiently organised and purposeful organism, even while a single ant is not actually aware of the overall process. Discussing this phenomena later under the name of “supergaming”, McGonigal (2005) defines supergaming as “tactical combination of network-based play and spectacle”, which is “embedded in and projected onto everyday public environments”, heightening the powers and capabilities of its players.

Mixed reality gaming in general has this potential of transferring empowerment gained in playful frame to the frame of everyday reality. This is partly due to the close interconnectedness of “fiction” with “fact”: rather than explicitly promoting the gameplay and everyday as something separate, mixed reality gamers experience a complex mixture of realities they are engaged with as a unified whole (much like illustrated earlier in our Figure 1). The energy and incentive that the playful use of digital technologies is increasingly associated with, has drawn gradually more attention from those studying social and political participation. Not just the experimental or avant-garde games, but also online social media sites (such as Facebook, Youtube and blogs of various kinds) are described as hothouses for grassroots civic participation (see, e.g., Connery 2008; Winograd & Hais 2008).

The future possibilities of mixed reality game design are related to this fruitful overlap of social technologies and dynamics stimulated by the fusion of gaming frames with the frames of everyday affairs and realities. The aesthetics of mixing thrive in rich combinations, and ongoing trends in information and communication technologies are likely to provide even more possibilities for making playful combinations between various aspects of different frames. One trend like this is

related to the ubiquity of computing and sensor technologies; Adam Greenfield (2006, 1) has named this vision of all-encompassing connectedness as “everyware” – in everyware “the garment, the room and the street become sites of processing and mediation”. In other words, in terms of technical and media development, society is heading towards environments that are optimal for advanced mixed reality play.

Another trend is related to development of complex information and media “ecologies”. In an era of increasing interconnectedness, games, media, and technologies exist in relation to their users in systemic interrelationships and dependencies that remind us from biological ecosystems that are complex and dynamic in a somewhat similar manner (cf. Nardi & O’Day 1999, 51). Adopting a different perspective, this development means transition into an “attention economy” where human attention – awareness, cognition and energy – are a scarce resource. The business consultants Thomas H. Davenport and John C. Beck (2001, 217), who draw attention economy as a concept into popular awareness, point out that evolving technologies continue to “weaken the barrier that separates home from the intrusions of the outside world”. Since mixed reality play is based on cultivation of our navigation skills between and across variously mixed and conflicting frames of reference, it may hold one key to develop better sense of control and more possibilities for empowerment in these dense and challenging jungles of information. In the evolution of an “Internet of Things”, many new and surprising connections can be created between objects, locations and ideas of various kinds. The real challenge is now in cultivating information literacy into growing awareness of our capacity to access and make and use of all this information – a quality of mixed reality world dubbed as “ambient findability” by Peter Morville (2005). As digital games grow beyond the confines of virtual simulations, they have the capacity to empower people in their endeavour to make sense and to connect meaningfully with each other, while they play with their newly framed potentials.

References

All online sources accessed in June 21, 2008.

Apter, M. J. (1989/2007). *Reversal Theory: The Dynamics of Motivation, Emotion, and Personality*. (2nd Ed.; Orig. 1989.) Oxford: Oneworld.

Apter, M. J. (1992). *The Dangerous Edge: The Psychology of Excitement*. New York: Free Press.

Apter, M. J. (2007). *Danger: Our Quest for Excitement*. Oxford: Oneworld.

Bateman, C. (Ed.). (2007). *Game Writing: Narrative Skills for Videogames*. Boston: Charles River Media.

Bateson, Gregory (1955/1972) A Theory of Play and Fantasy. In: G. Bateson (ed.) *Steps to an Ecology of Mind*. New York: Chandler.

Binmore, K. (1994). *Game Theory and the Social Contract, Vol. 1: Playing Fair*. Cambridge (MA): The MIT Press.

- Binmore, K. (1998). *Game Theory and the Social Contract, Vol. 2: Just Playing*. Cambridge (MA): The MIT Press.
- Brenne, G. T. (2005). *Making and Maintaining Frames: A Study of Metacommunication in Live Play*. Unpublished Cand. Polit thesis, Department of Sociology and Human Geography, University of Oslo. Online: http://www.efatland.com/fate/Making_frames.pdf.
- Connery, M. (2008). *Youth to Power: How Today's Young Voters Are Building Tomorrow's Progressive Majority*. Brooklyn (NY): Ig Publishing.
- Davenport, T. H., & Beck, J. C. (2001). *The Attention Economy : Understanding the New Currency of Business*. Boston (MA): Harvard Business School Press.
- Ekman, I., Ermi, L., Lahti, J., Nummela, J., Lankoski, P., & Mäyrä, F. (2005). Designing Sound for a Pervasive Mobile Game. *ACM SIGCHI International Conference on Advances in Computer Entertainment Technology ACE 2005*, Valancia, Spain. Online: <http://doi.acm.org/10.1145/1178477.1178492>.
- Ermi, L. & Mäyrä, F. (2005). Player-Centred Game Design: Experiences in Using Scenario Study to Inform Mobile Game Design. *Game Studies* 3(1). Online: http://www.gamestudies.org/0501/ermi_mayra/.
- Ermi, L. & Mäyrä, F. (2007). Fundamental Components of the Gameplay Experience: Analysing Immersion. In: S. de Castell and J. Jenson (Eds.), *Worlds in Play: International Perspectives on Digital Games Research*. New York: Peter Lang Publishers. 37-53.
- Fine, G. A. (1983). *Shared Fantasy: Role-Playing Games as Social Worlds*. Chicago: The University of Chicago Press.
- Gitlin, T. (1980/2003). *The Whole World Is Watching: Mass Media in the Making and Unmaking of the New Left, With a New Preface*. (2nd ed., Orig. 1980.) Berkeley (CA): University of California Press.
- Goffman, E. (1961). *Encounters; Two Studies in the Sociology of Interaction*. Indianapolis: Bobbs-Merrill.
- Goffman, E. (1974). *Frame Analysis: An Essay on the Organization of Experience*. New York: Harper & Row.
- Huizinga, J. (1938/1955). *Homo Ludens: A Study of the Play-element in Culture*. (Orig. 1938.) Boston: Beacon.
- Interactive Institute (2002). *Visby Under*. The Interactive Institute, Zero-Game Studio, project description. Online: from <http://www.tii.se/trgl/Projects/195.html>.
- Jenkins, H. (2006). *Convergence Culture: Where Old and New Media Collide*. New York: New York University Press.
- Kallio, K. P., Kaipainen, K., & Mäyrä, F. (2007). *Gaming Nation? Piloting the International Study of Games Cultures in Finland*, Hypermedia Laboratory Net

- Series. Tampere: Tampereen yliopisto, hypermedialaboratorio. Online: <http://tampub.uta.fi/haekokoversio.php?id=202>.
- Lankoski, P., & Björk, S. (2007). Gameplay Design Patterns for Social Networks and Conflicts. *GDTW 2007 Proceedings*, Liverpool. Online: <http://mlab.taik.fi/~plankosk/blog/?p=105>.
- Lankoski, P. (2007). Goals, Affects, and Empathy in Games. Paper presented at the *Philosophy of Computer Games*, Reggio Emilia, Italy. Online: http://game.unimore.it/Papers/Lankoski_Paper.pdf.
- Lankoski, P., Heliö, S., Nummela, J., Lahti, J., Mäyrä, F., & Ermi, L. (2004). A Case Study in Pervasive Game Design: The Songs of North. *NordiCHI'04: Proceedings of the Third Nordic Conference on Human-Computer Interaction*, Tampere. 413-416. Online: <http://doi.acm.org/10.1145/1028014.1028083>.
- Leslie, A. M. (1994). Pretending and Believing: Issues in the Theory of ToMM. *Cognition*, 50, 211-238.
- Lillard, A. S. (1993). Pretend Play Skills and the Child's Theory of Mind. *Child Development*, 64, 348-371.
- McGonigal, J. (2003). This Is Not a Game: Immersive Aesthetics & Collective Play. In *Proceedings of the Fifth International Digital Arts and Culture Conference*, RMIT, Melbourne, Australia. May 19-23, 2003.
- McGonigal, J. (2005). Supergaming! Ubiquitous Play and Performance for Massively Scaled Community. *Modern Drama*. Special Issue on Technology. Ed. W.B. Worthen. 48:3 (Fall 2005), 471-491.
- Mäyrä, F. (2007). The Contextual Game Experience: On the Socio-Cultural Contexts for Meaning in Digital Play. In: A. Baba (Ed.), *Proceedings of DiGRA 2007 Situated Play*. Tokyo: DiGRA & DiGRA Japan. Online: <http://www.digra.org/dl/db/07311.12595.pdf>.
- Montola, M. (2005). Exploring the Edge of the Magic Circle: Defining Pervasive Games. In: *DAC 2005 Conference Proceedings*. December 1-3, 2005, Copenhagen. IT University of Copenhagen.
- Morville, P. (2005). *Ambient Findability*. Beijing: O'Reilly.
- Murray, J. H. (1997). *Hamlet on the Holodeck*. Cambridge: MIT Press.
- Nardi, B. A., & O'Day, V. (1999). *Information Ecologies: Using Technology with Heart*. Cambridge (MA): The MIT Press.
- Nichols, S., & Stich, S. (2003). *Mindreading: An Integrated Account of Pretence, Self-Awareness, and Understanding Other Minds*. Oxford: Clarendon Press.
- Nieuwdorp, E. (2005). The Pervasive Interface: Tracing the Magic Circle. In: *Changing Views: Worlds in Play. Proceedings of DiGRA 2005 Conference*.

Vancouver: Simon Fraser University. Online:
<http://www.digra.org/dl/db/06278.53356.pdf>.

Rouse, R. (2005). *Game Design: Theory and Practice* (2nd ed.). Plano: Wordware.

Salen, K., & Zimmerman, E. (2004). *Rules of Play: Game Design Fundamentals*. Cambridge (MA): MIT Press.

Snow, D. A., Rochford, E. B., Worden, S. K., & Benford, R. D. (1986). Frame Alignment Processes, Micromobilization, and Movement Participation. *American Sociological Review*, 51(4), 464-481.

Sobel, D. M. (2004). Children's Developing Knowledge of the Relationship Between Mental Awareness and Pretense. *Child Development*, 75(3), 704-729.

Stenros, J., Montola, M., & Mäyrä, F. (2007). Pervasive Games in Ludic Society. In *Proceedings of the 2007 conference on Future Play* (pp. 30-37). Toronto, Canada: ACM. Online: <http://doi.acm.org/10.1145/1328202.1328209>.

Winograd, M., & Hais, M. D. (2008). *Millennial Makeover: MySpace, YouTube, and the Future of American Politics*. New Brunswick (NJ): Rutgers University Press.

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