WHY CARE ABOUT VIRTUAL LANDSCAPES? IMMERSIVE OPEN WORLD GAMING RELATED TO POSITIVE HEALTH.

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ABSTRACT

For some reason many people enjoy, spend long hours and pay for being out on virtual fields, playing an avatar that needs to hunt, prey, hide, survive and interact with all kinds of programmed entities and online players. Surely the designers and programmers deserve praise for their efforts and achievements in yearly progress on more detailed and increasingly immersive virtual experiences. But does that suffice to care about virtual landscapes other than classifying them as artificial places for fun and diversion? In this paper I will make a first attempt to relate virtual landscape experiences to accumulated insights in environmental psychology and theories on landscape aesthetics. My aim is to argue convincingly that open world gaming in virtual landscapes contribute to positive health, additionally to and perhaps even equal to real outdoor alternatives. I will also present a descriptive framework to describe the designerly elements present in one specific example of a recent open world game: Red Dead Redemption II (Rockstar 2018).

Figure 1: Artwork Red Dead Redemption II, Rockstar Games

A TASTE OF GAME EXPERIENCE

Still in my pyjama's, with fresh coffee made, I boot the system to engage with another episode of my Red Dead Redemption II experience. Headphones ready, just a short while now, before the familiar set of loading screens fluently render into an opening scene. My outlaw character appears, leaning against a bolder, sometimes squatting near to a ridge, patiently enjoying the view. As soon as I caress my finger against the controller, Arthur Morgan responds, stretches and grunts. Depending on the location I last left this causes a dust upheaval, stirs a bypassing character to politely greet, or makes my faithful horse neigh. It may be that the sun is rising, it may be raining or it may be that wild animals are grazing close by, not yet noticing me.

As soon as I gain full control, the environment is responsive and I am visually and auditory captivated; such richness of sounds, subtle movements of vegetation and in the sky. My aim for now? I could finish unfinished business or scout the map for highlighted locations. I could just roam around freely.

I could pick a fight, rob a bank and lower my honor to such a degree that characters will start to neglect me or act afraid. I could ride along with the storyline and see what challenges await my gang. I could try to locate treasure or hunt and skin a legendary animal. I could die, re-spawn, lose some and win some. Whatever I do, I will be immersed within impressive landscapes, awe-inspiring weather changes and all pervasive animal and vegetative presence at a thrilling and yet mainly slow and thoughtful pace.

One definition of 'the natural world' states that it ought to be a 'dynamic, multisensory flow of information that is essentially infinite in its depth, diversity and potential for discovery' (Reed 1996). Another that it should include recurring patterns, where nothing ever happens exactly the same twice and feasts the inexhaustibly new (Chawla 2007). Both sets of qualities could well apply to the world that is created in Red Dead Redemption II (abbreviated as Red Dead) and this implies that a virtual landscape might be well be up to be included in what can be referred to as 'the natural world'.

For gamers, the size of the game map is a means to measure the awesomeness or epicenes of open-world games such as Red Dead. The map of this game is four times the size of the previous game. An online estimation speculates on the first Red Dead map to be 31 square kilometres, 'while the 2018 prequel weighs in at an incredible 75 square kilometres' (Fish 2018 (updated 2019)). An outdoor equivalent of this in my home country can be found in the average size of one of five islands in the North of the Netherland (see: Figure 2). These islands are well appreciated for their size and variety in openness and authentic and natural features.

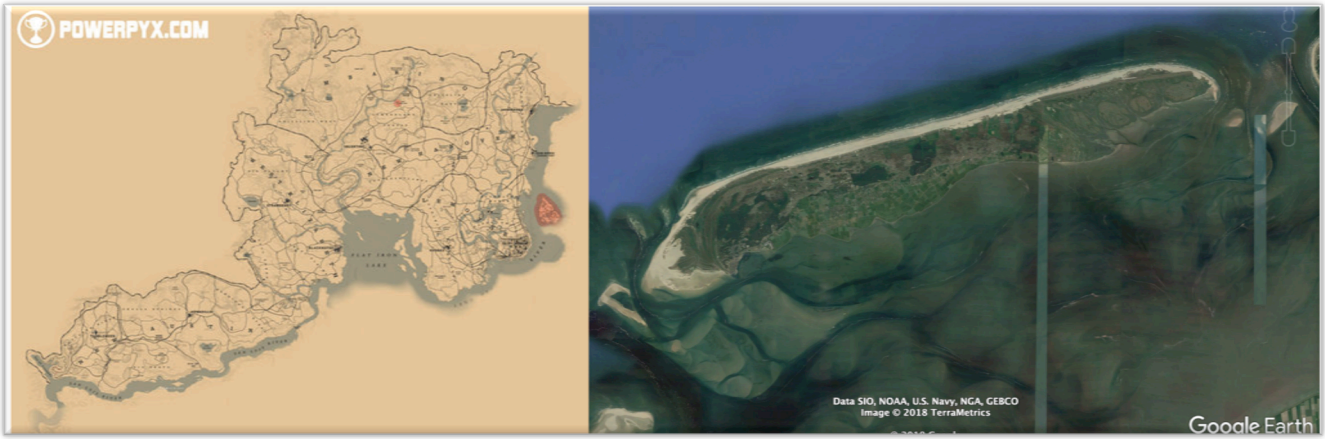
Figure 2: size comparison by the author between the map of Red Dead Redemption II (left) and the Wadden island Terschelling (right).

A WASTE OF TIME OR PRECIOUS TIME?

For many decades now, there is within a community of landscape experience researchers an all-pervasive disgust for 'the replacement of multisensory experiences in richly textured landscapes with the two-dimensional world of books or the audio-visual world of TV, videos, and movies' (Nabhan et al. 1993). In the last decade, this revolt has increased due to clues that this will have serious effects on positive health issues and serves as an obstacle to reversing global environmental degradation (Soga and Gaston 2016). A kind of 'extinction of experience' (Pyle 1993) explains how less everyday outdoors experiences relate to a declining care for real landscapes and nature agency. Being a regular gamer and landscape designer myself, I have first hand experiences that tell me otherwise. My virtual experiences have rather enriched my capacity to enjoy being outdoors and care for specific types of landscape that resemble my virtual playing fields.

The two-dimensional and the real are not mutually exclusive they can be aligned. Take for instance the overwhelming success of the Lord of the Rings movies for the popularity of natural scenery and wildness in New Zealand's landscapes. Although the reason to visit elfish or Hobbiton New Zealand may be based on a fiction and thus far from any authentic or historic truth, this 'staged authenticity' obviously is a new phenomenon that directly relates to interest and care for specific types of landscapes and nature reserves (Tzanelli 2004).

Is this type of staging different from that of the Lake District in Great Britain as the home country of Wordsworth, Coleridge, Beatrix Potter or Ruskin? Or does the Surma, a legendary and terrible beast that guards the gates of Tuonela, really exist in Finland?



The issue at stake here is whether staged experiences contribute to care for landscapes and if so, is this type of care different from real world generated care?

Within the field of environmental psychology, that rather refers to nature or green space as the central terminology instead of landscape, it is generally agreed that people's orientation toward nature is likely to be reinforced by direct interactions with nature during childhood times (Chawla and Derr 2012). And yet, it is also a fact that the average child spends less time outdoors. The 'last child in the woods' by Richard Louv (2005) highlighted a worrisome divide between a new generation and the outdoors, compared to a staggering increase of time spend online and in virtual realities.

'That youth connect to the essential nature of "wilderness" without necessarily gaining transferable skills leads to an important question: will youth come to see nature as a medium to be used for personal growth and benefit, or will it also be respected and cared for?' (Morrison 2010). What is emphasized with this quote is the difference between an enjoyable experience and lasting change in core behaviours. If virtual landscapes and nature remain mere products for consumption, they may also remain restricted to personal growth and benefit. But can they also serve a lasting care for the outdoors?

Environmental psychologists underscore time and time again, that real outdoor experiences cannot be replaced by simulacra or screen related immersion, but what is their evidence? Most methods to proof a causal relation between green space and health are laboratory conditions in which people view images or clips (Velarde et al. 2007), watch aquariums (Cracknell et al. 2018) or watch and enjoy *Planet Earth* (Zelenski et al. 2015). Zhang *et al.* (Zhang et al. 2014) found an effect of landscape experience on subjective well-being, greater self-esteem and willingness to help others, as long as individuals are familiar with a tendency to feel connected to nature *and* feel enabled to appreciate the beauty of nature. The authors speculate that a sense of *awe* may be particularly relevant as a precondition and further speculate to try and improve the overall visual attractiveness by 'greater elements of water, depth of field, and vegetation' (ibid. 61). My question is: with pixels or with what?

There are some indications of a more physical causality between health and landscape interactions, such as through smell or by affecting immune systems (van den Berg 2017). Yet the majority of evidence is related to pure visual impact and even the most promising future fields indicate still more visual conditions, such as viewing computer-generated natural fractals that increase EEG-recorded alpha waves, an indicator of a wakefully relaxed state (Hagerhall et al. 2015). Remarkably, auditory research is silently absent. While the interaction between audio and visual so obviously creates the immersive effectiveness in games (and movies).

Why do these researchers include so many visual evidences and methods and yet painstakingly avoid the coming out of the virtual? It would appear much wiser to aim for a convergence of the two, aligning the enjoyable benefits of the virtual with the physically more demanding engagement outdoors. As in a duet these could very well enable a designerly formula for an increase in care for the natural world, as well as an increase in health benefits: immersive open world gaming alongside visits to and protective programs for national parks and fittingly designed neighborhood green.

POSITIVE HEALTH AND VIRTUAL EXPERIENCES

The first hurdle to take and bridge virtual and real landscapes is to discuss health related issues regarding both. I will, for now, neglect the negative impact of screen time on the development of eyesight (e.g. short-sightedness) or physical activity and food consumption (e.g. obesity). Also from here on, I will consistently use the terminology of landscape instead of nature, environment or green space. The concept of landscape is more appropriate because it highlights the aspect of the staged, the constructed and the designed. And because the game Red Dead is situated in the rural and natural backdrop of the United States in 1899, specific attention is given to rural and natural landscapes.

When discussing health aspects that are specific to rural and natural landscapes, Opdam (2018) regards these as contributing to positive health. Positive health is a more broad definition of health, including inspiration, meaning, well being, quality of living and social value (Huber et al. 2016, Seligman 2008). With some flexible mind, all of these can be qualitatively attributed to include virtual landscapes as well.

At its very foundation, research on landscape experiences can be divided into two main approaches: landscape preference studies and place attachment research (Jacobs 2006). To start with the latter, intensities of 'meaning' define types of place attachment (Gifford 2014).

The geographer Yi-Fu Tuan (Landscapes of Fear 1979) argued that even negative emotions such as fear capacitate individuals to give places significance, including stress and survival related skills. Given the long journey through Red Dead with an average of 65 hours[1] of gameplay, this length of story driven immersion provides a rich diversity of experiential meanings at different levels of intensity, including indeed negative and fearful emotions. **Rich gameplay may allow for a broad expose of meanings that relate to various types of place attachment.**

Landscape preference research on the other hand, is related to environmental psychology with the underlying assumption that preferences for certain types of landscapes relate positively to reward, happiness, stress reduction and physical health. There are three theories that try to explain landscape preferences – the arousal theory (Berlyne 1974), the prospect–refuge theory (Appleton 1975) and the information processing theory (Kaplan and Kaplan 1989) – all seek to explain how the human experience has, during the course of evolution, gained certain innate, or biological, characteristics (Jacobs 2006).

A dominant explanation for preferences is provided by the biophilia hypothesis (Wilson 1984). This suggests that the African Savannah, which contained many trees for refuge and plentiful open space for prospect, is the original template for the most highly preferred type of landscape. This 'authentic' landscape is supposedly still hardwired in human perception and explains survival-related preferences with a certain focus and emotional response. In Red Dead, the North American version of the Savannah are the Prairie Fields with - in reality extinct - bison hurts are at the heart of the map.

Jacobs (2006) highlights research that confirms that children younger than eleven prefer savannah landscapes, 'while children above this age prefer their home environment' (ibid. 36). This indicates that mainly children younger than eleven act according the biophilia hypothesis and prospect-refuge theory. And indeed, other research reveals that free outdoor play and immediate contact with nature can support children's healthy development, being physically more active, more creative, more collaborative, balanced, coordinating and controlling impulses (Charles and Senauer 2010).

Joye and de Block (2011) postulate a critique on the biophilia hypothesis because it is more likely that grown ups have evolved towards 'wiping species X out' or to change the original environment (ibid. 206). This critique may be taken as a justification why gaming environments are often aggressive, bloody and hostile. The opportunity to explore harsh artificial landscapes allows exploring equally harsh and unethical grown up experiences (Joye 2007). There obviously is neither evidence nor agreement for an authentic base for grown up landscape preferences and since many open world games are rated 16+, this is relevant.

An alternative route to help explain preferences is found by accepting that we not only 'read' the landscape but also are 'involved' in the landscape; landscape is a verb and a performance (Wylie 2007). Walking and working in the landscape using muscular power and hand–eye coordination are as much part of the aesthetic experience as looking and daydreaming. Their combined effect is what constitutes aesthetic interactions, or what James Gibson refers to as 'affordances' (Gibson 1977).

Affordances are provoked by natural features, such as topography or objects, which invite humans to grasp possibilities for interaction (Heft 2005). An example would be the discovery of a natural staircase formed by the roots of trees that cling to the side of the mountain. In Red Dead this is present by navigating the landscapes while looking for traces, treasures or geographic clues to navigate off road terrain. But also by the many ways you can interact with the environment that are not necessarily needed for the storyline. On Youtube channels, there are examples of players that use the affordances of objects in the game to let the avatar perform in unexpected ways. Like catching a non-playing character in all sorts of creative manners, enjoying and sharing unexpected software glitches[2] and stumbling across Easter eggs[3] (e.g. Youtube 2019: top 50 funniest fails). These are typical game-affordances

[1] Around 65 hours would also be needed to binge watch all seven seasons of Game of Thrones, so imagine what depth of information and narrative richness can be communicated in an equally immersive time spent.

[2] A glitch is a short-lived fault in a system. The term is particularly common among players of video games because it causes visual effects that can be funny, strange or disturbing.

[3] In gaming an Easter egg is an intentional inside joke, hidden message or image, or secret feature of a work and refers to traditional Easter egg hunt. The term was first coined to describe a hidden message in the Atari video game *Adventure* (1979).

related to cultural memes (Dawkins 1976) and now popular internet memes.

An obvious benefit of open world gaming over sheer visual landscape preference studies by means of photographs, clips, aquariums or movies, is the level of interaction that is possible. A type of interaction that even far exceeds what is allowed when visiting real outdoor parks and conservation areas. **Interactive gameplay may allow for a large diversity of affordances to be explored that relate to various preferences and effects on positive health (e.g. reward, happiness and stress reduction).**

GAME DESIGN AND THE SUBLIME

The second hurdle to take and bridge virtual and real landscapes is to discuss the viewpoint of the aesthetic design. While the discourse in environmental psychology is mainly concerned with the perception of outdoor reality; the discourse in landscape aesthetics is profoundly influenced by the two dimensional fields of landscape painting, literature and poetry (Thompson 2009). In the eighteenth century the English social elite travelled to Italy for 'cultural improvement' (ibid. 49) and it was the combination of Italian landscapes, the strenuous crossing of the Alps during the Grand Tour and the vast landownership by the elite that spun the discourse on landscape aesthetics in Europe. It was not only the gentleness of the English landscape that was aestheticized, but also an Arcadian interpretation of classical literature (ibid. 50).

The aesthetic centralization of human fascination is philosophically known as the apolaustic bias within aesthetics (Chignell and Costelloe 2011). Even though parks and public space are of great social value and may offer some microclimate benefits (Klemm et al. 2017), they are not well known for their benefits to biodiversity. Designers mainly shape nature into landscapes according a human capacity for lust, relief and experience. So here we could find a welcome foundation to phenomena like the staged authenticity of the Lord of the Rings scenery and the increase of awareness for the wildernesses in New Zealand.

The picturesque has become the most feasible vehicle for landscape design (Wimmer 1989). Instead of creating pure wilderness scenery, a technique was perfected to create spatial perspectives that trick one's perception of space (e.g. seemingly larger than in reality). The picturesque draws the attention to the act of viewing and the resulting contemplation, a negotiation between the interiority of private feeling and the reality of the exterior world (Richards 2001). The often manipulated and tamed expressions of nature were kept at a critical distance and for this reason the picturesque 'has been theorized as the crucial contributor to the formulation of ideas of aesthetic distance in the late eighteenth century' (ibid. 26). The picturesque could 'control' wild nature, frame it like a picture, 'commodifying' it as an object of touristic appreciation (ibid. 24). At first glance the combination of narratives and awe-inspiring scenery in Red Dead links to this long nested idea of the picturesque.

Distance is a key concept to explore here because it contains a paradox. Similar to increasingly popular landscape paintings depicting a balance of beautiful material and sublime elements in the rich detail of dark-toned patina, which could be hung in almost any room, nowadays games can be present in almost any moment in time and be part of public space. So although the depiction of landscapes involves a critical distance in a human-nature relationship, it also allows for an increased and a more intense everyday encounter. Where the picturesque addresses a distant visual relationship, which is also reflected in the majority of environmental psychology research, open world gaming allows for a more interactive aesthetic inclusion. The interactive aspect of gaming in general and open world interaction specifically is in need of a more activating and interactive type of aesthetic framework.

As mentioned earlier, a thought-provoking difference between conventional park design and interactive virtual landscapes is the prevailing hostility of game environments. Not only do clear opponents set a challenge, the rough environment itself urges for survival skills. The fun of the game is to survive and outsmart. In aesthetic theory this corresponds with the somewhat forgotten and dusted idea of the sublime. The sublime is the most extreme type of aesthetics, a supernova of sensations (Lewis 2003). It is extreme, at both ends of the emotional spectrum – both in its uplifting and demanding forms. In its darker forms, it may be expressed as a harsh, Spartan lifestyle and a desire to 'live deep and suck out all the marrow of life' (Thoreau 1854). In a more light-hearted version it is an inspiring and creative experience with an uplifting effect (Longinus third century, reprint 2010 (1899)). In both instances it is foremost *awe*-inspiring.

The fact that the Red Dead game landscape and all its possible interactions even becomes bigger and more

complex with each step you take, induces the typical mixture of anxiety, awe and respect (Kant 1951 (1790)); the signature mark of the sublime. Within academia it is specifically the idea of the sublime that has been regaining relevance over the past twenty years (Ashfield and de Bolla 1996, Berleant 2009, Brillenburg Wurth 2002, Tuan 2013).

Some believe that the idea of the sublime may help human beings to regain a rightful humility regarding our treatment of nature (Brady 2013). In addition to more familiar media for the sublime such as literary works, paintings and other works of art such as music, fashion, architecture and design, the experience of the sublime is now being updated by cinematography, the internet and the gaming industry (Giblett 2008, Lanier 2014, McGonigal 2011).

Sensations described as 'sublime' are often associated with grand and astounding natural scenery, such as dizzy heights, erupting volcanoes and complex patterns of animals, oceans, clouds and plant growth (Burke 1998 (1759)). Such phenomena were not only deemed arrestingly scenic, they also seemed to address some ancient and symbolic aspect of life before human influence (den Hartog Jager 2011). An unmitigated confrontation with such an intense reference conveyed not only beauty, but a certain amount of awe, fear and horror as well (Tuan 1979, von der Thüsen 2008). This is reflected commonly in pre- or post-apocalyptic story plots within open-world games.

Interestingly, images of such natural scenes often included a special position within the landscape from which to best witness such sublime qualities. A famous example is Caspar David Friedrich's painting *Der Wanderer über den Nebelmeer* (1818). It depicts a lone man on top of a mountain overlooking a foggy valley stretching endlessly before him. Such vantage points are plentiful present while wandering in the landscape of Red Dead (see: Figure 3).

Figure 3: comparison between the painting by Friedrich and stills from the gameplay of Red Dead Redemption II.

Similar to controlling the characters of Arthur Morgan and John Marston later in the game, there are accounts on the sublime and hiking through the last wildernesses in Europe, such as those by Robert Macfarlane (2012) and John Wylie (2007). Filled with immersive descriptions of forgotten types of landscapes and equally forgotten types of interaction and crafts. In Red Dead there is the notion of a challenging journey through the wild and unexpected that helps to build character. The journey and the events are cathartic in which the hero must rely on his or her ability to improvise and overcome mesmerizing obstacles. Real-time rendered audio-visual presentation of the wind, the sounds, the view and the ever-changing face of nature are vivid and give way to an immersive sensation of 'being'.

The same is true for so-called urban jungles (Bunschoten 2010), which can best be explored by getting lost in a more or less intoxicated state, as demonstrated by the Paris based Situationist Guy Debord (1995 (1967)). This type of immersion is crafted within the game using artificial intelligence and the programming of non-player characters (NPC) and animals. Such features are not only visually constructed as in paintings they are algorithmically simulated. Meaning that weather and climate events have an interactive system presence either randomized or plot related.

If indeed the aesthetic framework of the sublime fits to describe the landscape design of the game, then the idea of the sublime is in for a drastic contemporary update. In previous research, colleagues and I have already speculated on such an agenda (Roncken 2018, Roncken and Convery 2016, Roncken et al. 2011). Significant changes that are not yet included within the idea of the sublime but are strongly applied in game design are algorithmic simulation, artificial intelligence (A.I.) and audio-visual immersion. **The idea of the sublime as a designerly framework for virtual landscape design allows for a new agenda for landscape design in general and thereby include (1) algorithmic simulation (A.I.) and (2) immersive audio-visual techniques.**

DESCRIPTIVE FRAMEWORK

A descriptive framework for analysing the environmental psychology and aesthetic appeal of the open-world game Red Dead Redemption II presents the synthesis of this paper. So far, my conclusions offer a main structure that can be listed within a framework that

allows describing the virtual landscape experiences related to potential effects on positive health and design aesthetics:

1 - Rich gameplay may allow for a broad expose of **meanings** that relate to various types of **place attachment**.

2 - Interactive gameplay may allow for a large diversity of **affordances** to be explored that relate to various **preferences** and effects on **positive health** (e.g. reward, happiness and stress reduction).

3 - The idea of the **sublime** as a designerly framework for virtual landscape design allows for a new agenda for **landscape design** in general and thereby include **algorithmic simulation (A.I.) and** …

4 – [continue] … **immersive audio-visual techniques**.

Steven Bourassa (1991) already concluded that despite the vast amount of research that had been done, no comprehensive theory of landscape aesthetics had emerged to unify a myriad of factors involved, including biological, cultural and personal (ibid. 53). This myriad is mirrored by the myriad to indicate the broadness of positive health: physical, social and emotional (Huber et al. 2011). To complete the framework I suggest to position the four characteristics against the myriad of factors that together span a broad and comprehensive horizon when describing positive health benefits as well as aesthetic design principles (see: Figure 4).

This is of course ambitious, certainly when contained in one single paper. The stated ambition was to bridge aspects of the virtual and the real and it involves connecting health related science with the artistic principles of landscape design. The framework is built on findings in literature as discussed in this paper. The descriptions within the framework contain my own empirical findings while playing the storyline mode in Red Dead Redemption II – not the online mode. These descriptions were collected in a semi-structured phenomenological diary (e.g. Hepburn 1996).

The order of the four characteristics in the framework is different from the order presented in this paper. It seemed more logical to start with the description of the simulation and the immersive aspects because these allow for the virtual to manifest.

DISCUSSION AND CONCLUSION

If anything, this paper is suggestive and not proof of anything. Besides expressing my personal fascination for Red Dead, a lot of research questions remain before an enjoyable digital experience aligns with lasting positive changes in core behaviours. The alignment of these two opposing fields is complicated due to a deep-seated mistrust against technology as foe against the purity within nature and the experience of pristineness on positive health. In counter arguing I might have been overcompensating here and there. Despite including a wide and recent overview of literature on environmental psychology and landscape aesthetics, my strong focus still permits blind spots that may yet inform about strong negative effects of gaming in general and health issues regarding screen time. I should also warn that not just any type of gaming is discussed here, but the open-world with a realistic simulation of an historic era.

Still, there are some promising leads. There are strong arguments to be made that virtual landscape experiences offer equally direct positive health effects as now found in environmental psychology research. This is mainly due to the visual research methodology that is used to proof any causal relation between green and health. There are also strong arguments to be made that if indeed a precondition to any health benefits is dependent on a sense of *awe* (Zhang et al. 2014), then the sublime and immersive gameplay-features are strong candidates in providing so. This is both interesting for the development of the field of landscape design as well as game developers. A shared set of mutual design goals allows for equally mutual innovation in the fields of immersive audio(!)-visual techniques and the role of A.I. and simulation. This could ignite exciting mutual cooperation such as expanding on such techniques for direct use in landscape design and vice versa: expanding on landscape design and ecological (?) simulation within virtual landscape design.

A third lead is to regard an alignment of the virtual and the outdoors. If designed as a network chain from source to end product, open-world gaming can be connected to a value chain of care for real outdoors instead of competing against it. Games can be end of the pipe products that somehow, maybe with new financial products, indirectly relate to protecting those landscapes that have inspired the virtual. The design of green spaces within a daily urban system could also be included within the value chain.

I invite all interested designers and environmental researchers to continue analysing and describing such opportunities. Perhaps the suggested leads will develop into effective means to overcome negative human habits that prolong the current Anthropocene.

The game is on!

Figure 4: descriptive framework for analysing the virtual landscape experiences related to positive health and design aesthetics

Red Dead Redemption II - storyline Characteristics of gameplay and game design	The Biological (Bourassa 1991) Physical Positive Health (Huber et al. 2011)	The Cultural (Bourassa 1991) Social Positive Health (Huber et al. 2011)	The Personal (Bourassa 1991) Emotional Positive Health (Huber et al. 2011)
Simulating what? (sublime landscape design)	Audio-visual natural landscape context with 11 different geographic regions; avatar body with stamina, energy and control constraints; dependence on food and rest; laws of physics; 200+ species with specific wildlife animal behaviour; weather, climate, vegetative conditions; time span (x-times faster).	Gang and individual narrative context including side stories and singular challenges; non-player character (NPC) interaction and behaviour; new buildings and land structures created over time. In online mode: online players interaction and challenges.	Camera/cinematographic control; emotional character development; NPC development; death of main character and continuation with side character.
Immersive by what? (sublime landscape design)	Geo-referenced and narrative related dynamic changes in soundtrack/sounds/visuals; slow paced and regular progression in accordance with long travels on foot, by horse, coach or train; orientation by landmarks and map; interacting NPC and animal responses depending on choices made and deeds done.	Being part of a tribe; dark/good side fluctuation; friendship, stewardship, altruism, neglect, revolt; rewards and sacrifices; demanding repercussions after violent actions (wanted and hunted); rewards due to ethically good behaviour (cheaper and greater variety of goods).	Ever present, changing and adapting soundtrack and soundscape; limited cheating/rapid travel possible; flawless (no loading screens) gameplay, high-density resolution; flawless facial expression and lip synchronization.
What affordances? (landscape preferences)	Animal responsiveness (freeze, flight, fright or roaming undisturbed); adjusting to night-time/daytime differences; landmark navigation; accessibility restricted by laws of physics; means and speed of travel through various climate regions.	Gain or loss of reputation, being hunted, NPC remember and adapt to previous actions, improvement of interaction with in-game physical structures and items.	Clothing customization; choice between story mission; side events and free roaming; online exchange of in-game behaviour/secrets uncovered (Easter eggs) and funny system glitches.
What meaning is generated? (place attachment)	Survival by orientation; place attachment to favourite places, viewpoints and camping grounds while traveling around; signs of humility regarding animals, vegetation, weather and NPC behaviour that are 'at home' in the virtual landscape; larger course of events is not substantially influenced by character actions (i.e. untouched nature and continuous urban development).	The desperate story of the extinction of the outlaw way of life; individual actions versus tribal needs; the bleak story of urbanisation and cultivation and family relations; references to popular internet memes; a few horrific jump scares and encounters with extra ordinary and macabre non-player characters; violent encounters.	To be part of something big; missions become available in story driven sequence, in game items and capacities change according a dramatized script, ethical choices and story driven unethical behaviour, remorse, extravaganza and finally settling down in family life with strong friendships (storymode).

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