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Analysing virtual landscapes using postmemory

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ABSTRACT

Virtual environments are becoming ubiquitous, designed to do *work* in the material world. They are used within urban design, medicine, the military, entertainment and a wide range of other sectors, having increasing significance within our everyday lives. Virtual landscapes are brought into being through the interaction of users and these virtual environments. In this paper, we propose the use of postmemory as a framework for analysing virtual landscapes. Postmemories, formed of second-hand accounts combined with the imagination of individuals, can shape our responses to the world around us, having similar affective force to memories of situations directly witnessed. Twenty-five participants were asked to undertake an exploration exercise within a virtual recreation of 19th century London and subsequently interviewed about their landscape experiences. Individual position and imagination had a significant effect on participants' understanding of those landscapes, creating postmemories of the material environment being represented, going beyond the intent of the designers. Given the forceful affective qualities of postmemory, however, the balance of power between designer intent and user imagination is demonstrated to be problematic, as individuals are manipulated through their exposure to, and co-creation of, these virtual landscapes.

Analyser les paysages virtuels en utilisant la post-mémoire

RÉSUMÉ

Les environnements virtuels deviennent omniprésents, conçus pour faire du *travail* dans le monde matériel. Ils sont utilisés dans le design urbain, l'armée, les spectacles et une grande variété d'autres secteurs et ont pris une importance grandissante dans notre vie quotidienne. Des paysages virtuels naissent à travers l'interaction entre les utilisateurs et ces environnements virtuels. Dans cet article, nous proposons de nous servir de la post-mémoire comme cadre d'analyse des paysages virtuels. Les post-mémoires, composées de récits de seconde main associés à l'imagination des individus, permettent au monde qui nous entoure de revêtir diverses formes, ayant une force affective similaire aux situations directement vécues. On a demandé à vingt-cinq participants d'entreprendre un exercice d'exploration à l'intérieur d'une recréation virtuelle du Londres du XIXème siècle et on les a ensuite interrogés sur leurs expériences du paysage. La position et l'imagination individuelles ont joué un rôle important dans

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la compréhension de ces paysages par les participants, créant des post-mémoires de l'environnement matériel représenté qui allaient au-delà de l'intention de leurs créateurs. Etant donné les qualités affectives puissantes de la post-mémoire, l'équilibre du pouvoir entre l'intention des créateurs et l'imagination de l'utilisateur s'est toutefois révélé comme étant problématique, car les individus sont manipulés à travers leur exposition aux paysages virtuels et leur Co création de ces paysages.

Analizando paisajes virtuales utilizando la post-memoria

RESUMEN

Los entornos virtuales se están volviendo omnipresentes, diseñados para *trabajar* en el mundo material. Se utilizan en el diseño urbano, la medicina, el ejército, el entretenimiento y en una amplia gama de otros sectores, con una importancia cada vez mayor en nuestra vida cotidiana. Los paisajes virtuales se crean a través de la interacción entre los usuarios y estos entornos virtuales. En este artículo, se propone el uso de la post-memoria como marco para analizar los paisajes virtuales. La post-memoria, constituida por relatos de segunda mano combinados con la imaginación de individuos, puede dar forma a nuestras respuestas al mundo que nos rodea, teniendo una fuerza afectiva similar a los recuerdos de las situaciones directamente atestiguadas. Se solicitó a 25 participantes que realizaran un ejercicio de exploración dentro de una recreación virtual del siglo XIX en Londres y posteriormente se les entrevistó sobre sus experiencias en el paisaje. La posición individual y la imaginación tuvieron un efecto significativo en la comprensión de los participantes de esos paisajes, creando post-memorias del entorno material que se estaba representando, yendo más allá de la intención de los diseñadores. Sin embargo, dadas las fuertes cualidades afectivas de la post-memoria, se demuestra que el equilibrio de poder entre la intención del diseñador y la imaginación del usuario es problemático, ya que los individuos son manipulados a través de su exposición y co-creación de estos paisajes virtuales.

Introduction

Virtual landscapes, like material landscapes, are a product of the interaction between observer and environment, even though virtual environments only exist as code within a computer. These virtual landscapes, however, emerge out of virtual environments that have been consciously *designed* to do different kinds of work in the material world. Archaeological reconstructions, for example, help engage the public with the importance of their heritage. Architectural visualisations help planners and others understand the impact of a new development in an existing townscape. Military and medical simulations allow for training without putting lives in danger. The work that the virtual environment is intended to do shapes the kinds of landscape experiences it can offer. At the same time, the ways in which users interact with and co-construct these landscapes alters the capacity of virtual environments to do their intended job.

In this article, we suggest a framework for analysing these virtual landscapes, drawing on Hirsch's (1992) notions of postmemory. As we explore below, even where an individual has not or could not experience a site directly, second-hand accounts in combination with

imagination can produce postmemories. We argue that virtual landscapes can give second-hand and potentially flawed insights into material landscapes that suggest how the world was or could be. These insights produce postmemories that can have an affective force similar to the memory of experiencing a location directly. Like memory, postmemories have the capacity to both shape how an individual understands the material world and alter their subsequent behaviour.

We asked 25 participants to undertake an exercise exploring a virtual environment, followed by an interview about the experience. Drawing on this data-set, we argue that there is considerable scope for the imaginative to animate landscapes within virtual environments, with postmemories of a site emerging that go far beyond the designers' intent. We reflect, however, on questions of power, particularly as designers can rapidly alter virtual environments in response to the ways that users engage with them. Given the affective force of postmemories generated through virtual landscapes, we suggest that this capacity for manipulation is highly significant. Critical attention therefore needs to be paid to the ways in which virtual landscapes are being enacted and their effects on how we understand and act in the material world.

Working with postmemory

The conceptual development of postmemory has been a long-term project for Marianne Hirsch since she first coined the term in the early 1990s. In her early writing on the subject, Hirsch (1992) saw postmemory as being a phenomenon linked to those individuals who grew up as the children of Holocaust survivors. She used an analysis of Art Spiegelman's *Maus* as a starting point for thinking through how the children of holocaust survivors coped while growing up with the burdens their parents carried and the extent to which parents' stories became woven into the children's own memories. *Maus* is a celebrated pair of partially autobiographical graphic novels through which Spiegelman attempts to understand his parents' experiences during the Holocaust. The books play with notions of how memory and experience are owned. For Hirsch, *Maus* spoke clearly to her own experience as the child of Holocaust survivors, immersed in family stories of events that she was not herself witness to. *Maus* and similar works of postmemory are thus grounded in second-hand but deeply felt accounts.

In the decades since that original paper, Hirsch has continued to refine her ideas in parallel to the evolving field of memory studies. Hirsch (2015) argues that postmemory allows us to distinguish memories derived from experience and *memory-like* qualities acquired second-hand. She has suggested that 'Postmemory is not identical to memory… but at the same time, it approximates memory in its affective force'. (Hirsch, 2008, 109). This notion of affective force draws on the conceptualisation of affect familiar to non-representational theorists: the capacity of a body to change and be changed by the world around it (B. Anderson, 2006). Affect thus has strong ties to the emotional and the embodied, with memories directly shaping how an individual understands and interacts with the world around them. Postmemories, Hirsh argues, have a similar power to memory in shaping these affects. Thus, events that we have not witnessed can be seen to have an affective pull upon our lives.

Postmemory emphasises the creative and the imaginary rather than the purely experiential. Although her initial writings about postmemory suggested that it was a product of

growing up in a household with holocaust survivors, Hirsch later expanded this. Thus, affiliative postmemory explores 'alternative structures of transmission' (Hirsch, 2012, 23), beyond the familial experience. Hirsch has particularly focused on photography and visual arts/representations as means of this affiliative transmission:

> The repeated Holocaust photographs connect past and present through the 'having-been-there' of the photographic image. They are messengers from a horrific time that is not distant enough. In repeatedly exposing themselves to the same pictures, postmemorial viewers can produce in themselves the effects of traumatic repetition that plague the victims of trauma… (Hirsch, 2012, 122)

The experience of virtual landscapes that we describe below is a very long way removed from the abhorrent events of the Holocaust and similar historical ruptures. Indeed, the casual virtual violence of many video games sits awkwardly with an intellectual framing conceived to help understand the implications of horrific events that occurred in the material world. There is, however, nothing specific in the theorising of postmemory that necessarily requires a traumatic event to have taken place in order to form postmemories – the focus on trauma simply reflects the disciplinary background from which these ideas have emerged. What we wish to take from postmemory, therefore, is an understanding of how a past that has not been personally witnessed can take on meaningful qualities through a practice of creative engagement.

Of particular significance for this paper, landscape can be seen to act as a vector for the transmission of postmemory. For Hirsch, the role of landscape is implicit in her examination of artistic responses to the photographic documentation of concentration camps (for example in Chapter 4 of Hirsch, 2012). Kaplan (2011), meanwhile, has been more explicit in considering the relationship between landscape and postmemory. Again, reflecting the disciplinary origins of postmemory, Kaplan considers how landscapes associated with the Nazi regime have subsequently been used. Hitler's Berghof mountain retreat at Obersalzberg was demolished and, in 2005, became the site of a five-star hotel. The iconic mountain view that was framed by the windows of the Berghof thus had its meaning altered, no longer being a manifestation of Nazi power and celebration the regime's anti-urbanism. Instead, that landscape view became a marketing tool within the circuits of global capitalism, with visitors to the hotel able to swim in 'a beautiful pool on the very spot where the Third Reich's elite frolicked' (Kaplan, 2011, 6).

This effacement of certain Nazi associations from the landscape of Obersalzberg stands in stark contrast to concentration camp sites such as Auschwitz. Here, the landscape has been carefully conserved and curated in order to give visitors a sense of being witness, second-hand, to the events that took place there. This witnessing-through-landscape is intended to generate postmemories, intensifying the understanding of what occurred in those spaces for those who cannot today be witness to those events. The nature of landscape is that it is a co-construction between the environment and the individuals experiencing that environment. Clearly, therefore, the landscape one experiences at Auschwitz today is utterly different to that which was experienced in the 1940s by its victims (and, indeed, its guards). There are questions of power in how the environment is framed to produce particular landscapes today and how curatorial decisions are made with the intention of fostering postmemories of the Holocaust in visitors. This process has commonalities with Nora's (1989) notion of *lieu de mémoire* – those sites that are established as part of a process of archiving memory. Spaces of memorialisation are curated to act as a symbol of a past that

will shortly pass out of living memory. This symbolism becomes key to determining how a site may be used and thought about. Alternate meanings of those sites are forgotten and possibilities for changing those meanings are squeezed out.

We argue that postmemory is a powerful tool for understanding landscape beyond the specifics of the Nazi period, trauma and memorialisation. Walking in the Lake District, for example, gives an opportunity for visitors to think about the lives of miners who worked those hills. Today one cannot witness those landscapes as they would have been at the height of their industrial use, but by slogging up those hills we can fill in the gaps of the historical account (Davies-Shiel & Marshall, 1969) with an imagining of just how hard that life would have been in that landscape (Tilley, 1994). This combination of imagination and environmental engagement creates postmemories of industrial life in nineteenth century Coniston. Broadening this out, postmemory becomes a means of examining landscapes that we simply cannot witness, either because they no longer exist or because they have not been brought into being, but which changes our understanding of the landscapes we see today. Walking through the landscape across which it is proposed to build a new road might, for example, heighten the resolve of protestors as they envision the damage that will be done to that environment (J. Anderson, 2004).

The way that postmemory represents a blurring between experience and representation has significant commonalities with the conceptualisation of landscape as both material and the gaze upon that material (Wylie, 2007, 55). A performative conceptualisation of landscape moves us on from the kinds of binary understandings deployed in Raymond Williams' work which separated the observer from landscape. Indeed, Mitch Rose (2002, 463) argues that the seemingly 'definable material space [of landscape] is constituted by the totality of possible performances immanent within it'. This performative quality of landscape suggests a slippage between how landscapes are designed and used; it also highlights the implicit power relations in this relationship. This has significance in how virtual landscapes are conceived since on one level, being purely digital data projected onto an electronic screen, one could argue that humans are unavoidably separated from these landscapes. As we argue below, however, there is a quality of being *in* these landscapes even if they cannot be directly materially experienced. These virtual landscapes become entangled in the generation and transmission of experience beyond the material and, through this, the enactment of affiliative postmemory.

Virtual landscapes

Virtual representations of landscape are both highly detailed and pervasive in contemporary western society. These virtual landscapes can be conceptualised as a performative co-construction between the environment (created by the technology, interface and designers' intent) and the personal qualities of the individual experiencing that environment. Our primary empirical focus here is on the virtual landscapes associated with video games but as Degen, Melhuish, and Rose (2017) note, different kinds of virtual environments exist and are intended do *work* within the physical world. A common use of virtual environments has been in the architecture and planning professions. Eckart Lange has written extensively about how 3D visualisations can be used to inform planning practice, particularly where controversial decisions are being made about developments such as windfarms that will have a significant visual impact on landscape (Lange & Hehl-Lange, 2005). This technology

is not without its issues, however, as a photorealistic visualisation of a proposed development obfuscates the redesigns, overruns and compromises of the real development process, giving an illusion of a certain outcome where no such certainty exists (Lange, 2011).

These kinds of architectural and planning simulations do not have to be limited to the purely visual, with interesting work being undertaken to create virtual models of acoustic effects in different urban environments (for example, Rychtáriková, Jedovnický, Vargová, & Glorieux, 2014; Signorelli, 2015). When it comes to virtual landscapes, however, the visual has tended to receive more attention. This emphasis perhaps reflects Gillian Rose's assertion (in Merriman et al., 2008, 200) that 'there is something particularly visual about landscapes' that draws the attention of scholars. Ash, Romanillos, and Trigg (2009), for example, examine the use of video game software to build a virtual Amazon as part of a process of visualising hydrological models. Such virtual worlds can help scientists to make sense of their models and create a something akin to a tactile experience of spaces through combination of visualisation and imagination even where the landscapes on which the models are based have not been visited by the researcher. Such a game-based visualisation gives a sense of scale derived through an embodied, affective connection to these virtual spaces because they place viewers *in* the scene, suggesting a transmission of postmemory connecting them to the material location being represented. These virtual landscapes require much less skilled interpretation than, for example, an abstract two-dimensional GIS rendering of hydrological processes.

As we reflect on below, however, this raises important issues about the truth claims being made by digital renders of an environment. Virtual landscapes can possess varying degrees of fidelity and some seem to be presented as truthful representations of material spaces. Archaeological reconstructions, for example, have somewhat hybrid qualities, being grounded in the material realities of post-holes and subsurface remains, but traversing into the realm of the imaginative when representing how a site *may have* looked (Happa et al., 2012). Some genres of video games also fall into this category, where a great deal of historical research underpins the representations of existing cities on the screen, although these are distorted around the limits of archival material, the imagination of the designers and the need to produce a playable and enjoyable *game* within those spaces.

The *Assassin's Creed* series of games fall within this hybrid category. Key buildings in actual cities are reproduced with apparently breathtaking accuracy. In the *Syndicate* episode that we discuss in greater detail below, this even includes depicting the original east frontage of Buckingham Palace as designed by Edward Blore that would have existed at the time the game is set, rather than the Aston Webb-designed façade from 1913 that we see today (Figure 1). Despite this attention to historical detail, closer examination shows that building designs within the games have been manipulated to make them easier for characters to climb, as part of the parkour mechanism that is central to the gameplay mechanics. Similarly, the street layouts can have remarkable grounding in the actual layout of cities – heading north-east from Buckingham Palace to reach Trafalgar Square, for example. Again, however, these have been altered to improve gameplay, primarily by shortening distances and inserting generic, repeating elements to fill in the streetscape between the famous buildings.

Video games offer a very particular kind of virtual environment. In part, this is because the budgets available to game designers allow for the creation of much more complex, nuanced and, simply, *bigger* virtual landscapes than would be within the capacity of, say, an architectural firm creating renders of a new building.[1] More than this, however, game

Figure 1. Some games designers expend considerable effort in recreating historic landscapes, as here with Edward Blore's original design for the east frontage of Buckingham Palace as it appeared in the 1860s. Source: *Assassin's Creed: Syndicate*, Ubisoft 2015. Gameplay footage from Phil Jones.

landscapes are built on the requirements of story and play. Flynn (2003) highlights the importance of spatial design to the aesthetics and immersive qualities of games. As Shaw and Sharp (2013, 344) note:

> It is the ludic quality of video games, in which narratives are shown to the player through spatial exploration, rather than being simply told, which separates video games from other types of media…

This has clear resonances with arguments made by Ingold (1993, 152) suggesting that 'the landscape tells – or rather is – a story' because of a multigenerational engagement with those spaces that has shaped their formation. Video game landscapes, similarly, are not merely passively received by players. Despite the fact that the landscape parameters are framed by coders and designers, players actively construct how those landscapes function, through the ways in which they interact with those spaces (Ash, 2010). This, in turn, allows the memories and experiences of players to be shaped by but also to reshape these game worlds.

A good example of this process is with the fictional world of Norrath in the online massively multiplayer game EverQuest. Haylot and Wesp (2009) have undertaken a detailed analysis of the game and how it has evolved during its life. Originally the designers placed cities with houses, schools, taverns and so on within the landscape, but they were barely visited by players because there was no gaming reason to be in those spaces – there were no quests to undertake or resources to acquire. Instead, players gathered and formed online communities at locations that were associated with the fast travel 'spells' that facilitated movement around the game world. Spaces lacking a direct outcome in terms of gameplay thus became meaningless, empty areas to be traversed as quickly as possible. Over the years that the game operated, the designers started to produce expansions to the world of Norrath built around the way in which players actually used the game environment, making that environment responsive rather than merely representational.

What the Norrath example suggests is that game landscapes act as a kind of palimpsest. The designers produce the environments with certain intentions in mind, but these will be performatively reinscribed as gamers seek to impose their own priorities on those spaces. As Wood (2012) argues, game landscapes might be considered *recursive*, as designers react to the ways players interact with these spaces and make changes which in turn alters players' interaction in sometimes unexpected ways. Gaming landscapes can thus be seen as both spatial and performative, with a grounding in the kinds of spatial uses seen in everyday landscapes, but reworked by the demands of gameplay (McGregor, 2007). As Longan (2008) has argued, in many games, the overarching objective is to bring harmony to a broken or disharmonious landscape, by solving puzzles, overcoming enemies and rebuilding settlements. Although there is a clear element of masculinist fantasy around conquest and ordering in such activities, this harmonising of landscape becomes a key element in driving attachment to the virtual environment that has been *made* by the player.

This interactive *making* of landscape is of particular interest where games seek to draw on actual historical events and environments. Hong (2015, 36) draws on notions of postmemory to discuss the 'pragmatic pillaging of historical, mythical and ritual elements' within certain genres of games, suggesting that understandings of the past are partially the product of imagination. He thus argues that they create situations that are 'real enough' to generate intense and personally significant experiences for players. The games discussed by Hong tend toward the bricolage, combining different historical and mythic elements. By contrast, Chapman (2016b) has undertaken a detailed examination of some 58 games that were partially or completely set during the events of World War I. Drawing on postmemory, Chapman suggests that the events of this war can still have an emotional resonance to individuals even though it is now beyond living memory and that these postmemory qualities impact how the games are understood and experienced.

There is an exciting, emerging area of research looking at how history and cultural memory are played out within games (for example Hammar, 2017; Pötzsch & Šisler, in press). This work has been championed by Adam Chapman, but in common with other writers in this field such as Hong, little explicit attention has been paid to questions of how *landscapes* are being co-created by game designers and players. Chapman (2016a), for example, does discuss the role of *space* within gaming, but does so in a manner that geographers would find somewhat limited, focussing on space as either container or representation. In this kind of account, landscape becomes a synonym for environment rather than being something that space actively *produces* together with the individual. Nonetheless, the nature of games as interactive landscapes reinforces Chapman's (2012) point about the importance of directly *playing* these games in order to analyse them, rather than simply studying them as texts. Through play, games with historical settings give an opportunity to engage with an imagining of a period that we cannot experience first-hand today. This, in turn, resonates strongly with the potential of landscape to act as a medium for the generation and transmission of postmemories, grounded in second-hand accounts and imagination rather than personal experience.

Methods

In order to examine how ideas of postmemory can be used to analyse virtual landscapes we turn to a case study of the 2015 game *Assassin's Creed: Syndicate*. This was a blockbuster,

'triple-A' release from gaming studio Ubisoft, forming the ninth major title within the series. The overarching story underpinning the series is somewhat convoluted, essentially forming a good vs. evil battle between the warring factions of Assassins and Templars, played out across a wide historical canvas from Cleopatra's Egypt, through the middle east during the Third Crusade, Renaissance Italy, the American and French Revolutions and into the present day. *Syndicate* is set in the 1860s and can be read as an implicit celebration of high Victorian London, a city whose wealth and influence was growing on the back of colonial conquest. As we discuss below, however, more ambiguous readings of that landscape of power are possible through an imaginative and ludic engagement with this virtual environment. Nonetheless, we acknowledge there is an element of irony in using *Syndicate* as the basis for an analysis of landscape given Mitchell's (2002) argument that our modern understanding of landscape is a product of the rise of western imperialism from the 18th century onward.

In common with the other major releases in the Assassin's Creed series, *Syndicate* is an 'open world' game, meaning that players are free to roam around a large cityscape (approximately 20 km^2). The game takes a third person perspective, with players able to control a 'camera' view that can be rotated around the avatar that they are controlling. Prior to the study, we had each, independently, spent in excess of 70 hours playing *Syndicate* meaning that we were very familiar with the city it depicts. This background knowledge helped to shape the interview questions as well as contextualise and analyse the resulting data.

The study was designed to examine how individuals create and navigate landscapes within virtual environments. The idea of landscape as a co-construction between individuals and environments is well established within Geography, but less attention has been paid to the performative qualities of virtual landscapes. In order to undertake this research, we specifically recruited participants who were academics at different career stages working in fields of geography or environmental studies. While there is no question that this sample does not represent the population as a whole, this cohort was familiar with landscape as a concept and thus able to make nuanced reflections about the landscapes they generated by interacting with the virtual environment.

Twenty-five participants were recruited, ranging in age from early 20s to mid-50s, with 12 female participants, 6 participants having English as a second language and the majority (20/25) having little or no experience of playing a modern, large-scale video game. Because the majority of participants did not self-identify as gamers, a short orientation exercise was undertaken with all to cover the basic mechanics of using the Xbox One Controller, explaining how to walk, run and change the viewing angle. Participants were given minimal guidance in the briefing, invited simply to explore the environment of the game in any way they chose. In order to reduce the complexity of the activity for novices, we gave no instructions on how to engage with the more complex parkour functions of the gameplay nor how to travel in the game's different vehicles. We did not explicitly ban non-pedestrian navigation, however, and some participants discovered and employed these alternative forms of locomotion.

All participants were asked to spend 20-minutes exploring the representation of Victorian London presented in the game, setting off from outside the familiar, globally iconic, location of Buckingham Palace. They were left alone to do this in an office space, sat within two metres of a 55-inch, high-definition screen playing the Xbox One version of the game. They were also provided with a paper copy of the game map to help navigation. We placed participants in a fully unlocked version of the game, with the various districts of London already conquered by the game's protagonist, meaning that they could move freely across the city

without fear of unprovoked attack by hostile characters. The gameplay was filmed and participants were subsequently asked to watch the playback of their activities in tandem with undertaking an unstructured interview examining their response to the virtual landscape. The video served as a prompt to ask questions about the choices participants had made when engaging with the virtual environment, with a focus on the production of landscape. Methodologically, these approach commonalities with the go-along (Kusenbach, 2003) or walking interview (Evans & Jones, 2011) technique, where participants are accompanied when walking around a neighbourhood, with the environment itself stimulating and framing the discussion. The use of video playback enables participants to undertake the initial navigation exercise unaccompanied so that the presence of the researcher does not interfere with the task (Osborne & Jones, 2017).

The interviews were audio recorded and transcribed by timestamp so that they could be aligned with the gameplay videos. This meant that specific quotes could be contextualised by revisiting moments in the video footage that participants were referring to. The transcripts were examined using NVivo and a process of axial coding was undertaken analysing themes that related to pre-existing theory around landscape as well as broader themes that emerged from the data itself. The coding was reflexive, with new categories applied to all transcripts and overlapping categories collapsed. One of the key themes that emerged from this process was how participants' understandings of virtual and material landscapes overlapped and informed each other. The role of the imaginative was another strong theme. The data analysis thereby led us to postmemory as a conceptual frame for examining interactions with virtual landscapes.

All 25 participants successfully completed the gameplay exercise, although one further participant was forced to abandon the task suffering from motion sickness caused by the movement represented on the screen. Some participants took longer than others to get used to the controls, though all were able to undertake virtual walks of a significant distance. Moffat, Hampson, and Hatzipantelis (1998) note that the tendency for men to perform better at spatial navigation exercises through unknown territories is also replicated in virtual environments. Within our sample, however, we did not notice any significant gender-based differences in how navigation around the virtual environment was undertaken.

Arnott (2017, 6) notes that when researching using video games, the type of gaming experience should be carefully selected based on the aims of the study. Given that we sought to explore virtual landscapes, rather than examine combat and other tasks requiring good hand-eye coordination, the lack of gaming experience was not an obvious factor in how participants were able to engage with the task. Having the game landscape in an 'ordered', complete state (cf. Longan, 2008) was key to delivering the right kind of game environment for our research aims. Giving participants only a relatively short time to interact with the virtual environment was also valuable in that it meant that they would not immediately understand the compromises and choices made by the game designers when choosing which elements of the material world to reproduce within the game (Chapman, 2016a). The complexity of real world cause-and-effect is hard to reproduce in games – bumping into a pedestrian in the material world might have any number of different outcomes. Trying to represent all these different outcomes becomes impossible to manage unless the sole focus of the game is on the effects of bumping into people. Thus, a short-term gameplay exercise gives a greater illusion of being an accurate representation of the material world as participants have not yet learned the 'rules' of that environment e.g. that bumping into virtual

people results in shouted comments, but no other effects and thus does not need to be avoided in the way that one would in a material environment. This effect was enhanced using a cohort dominated by non-gamers, where their novice status was useful in taking longer to become familiar with the limitations of the environment (see the discussion about how gamers learn the rules of game environments in Juul, 2005, 95–6).

In the run up to the release of the previous episode in the series (*Assassin's Creed: Unity*, 2014), Ubisoft was subjected to a barrage of criticism when a spokesman claimed that it had proved too difficult to animate a playable female character (Huntemann, 2015). The studio explicitly highlights a commitment to inclusiveness as part of its games' opening credits and, reacting to this negative publicity, the subsequent release of *Syndicate* allowed players to use a playable female avatar for the first time. We did not give our participants the option of selecting their gender within the game, leaving them playing as the main female protagonist of the story, Evie Frye. This had not been a conscious decision on our part, but it serendipitously provoked a number of interesting and unexpected reflections by participants that we have included in our analysis below.

Analysis

One of the most surprising elements for our non-gaming participants was the scale and seeming photorealism of the urban landscapes within *Syndicate*:

> I was very impressed by the buildings and architecture and the detail of it. It just looked like you were walking in a city. And how people reacted to you. Which I wasn't expecting. That's really clever. I didn't realise that that happened in games. (Participant 03, female, 19 August 2016).

Some participants sought out the more famous landmarks to see how well they had been *reproduced* in the game. Others, however, saw the game more as a factual source of information about how things *would have looked* at this point in history. Participant 09, for example, was keen to see the Lambeth Asylum to compare it to her knowledge of the building today, but was also interested in the evocation of more ordinary urban scenes:

> I was quite interested in seeing Lambeth. Because of, you know, well, historically about Lambeth, you know, Lambeth's position across the river and that it was seen as the dirty part of town. You know. It's basically, site of vice and inequity and so on (Participant 09, female, 25 August 2016)

Participant 06 explicitly sought out the industrial spaces on the south bank of the Thames (Figure 2):

> I really liked being able to go into the industrial sites… Obviously, it's interesting for me in my research area… because so many of them have been demolished being able to experience that was really great. (Participant 06, female, 25 August 2016)

Given that London is now a largely post-industrial city, these kinds of London landscapes can now only be visited virtually. Ironically, however, these quotidian spaces are the ones where the game designers had less archival material to draw on and so relied more heavily on their own imagination to produce convincing urban scenes – imagination being a key element in the creation of postmemories. There is a slippage here between understanding the game landscapes as merely *evoking* the period and actually giving meaningful insights into society as it existed at the time. The seemingly accurate reproduction of famous buildings gives a somewhat seductive quality to these virtual landscapes that tempts the player into feeling as though they are experiencing what it was like to walk the streets of Victorian London. The interactive quality gives a sense of being *there*, more intensely than the still
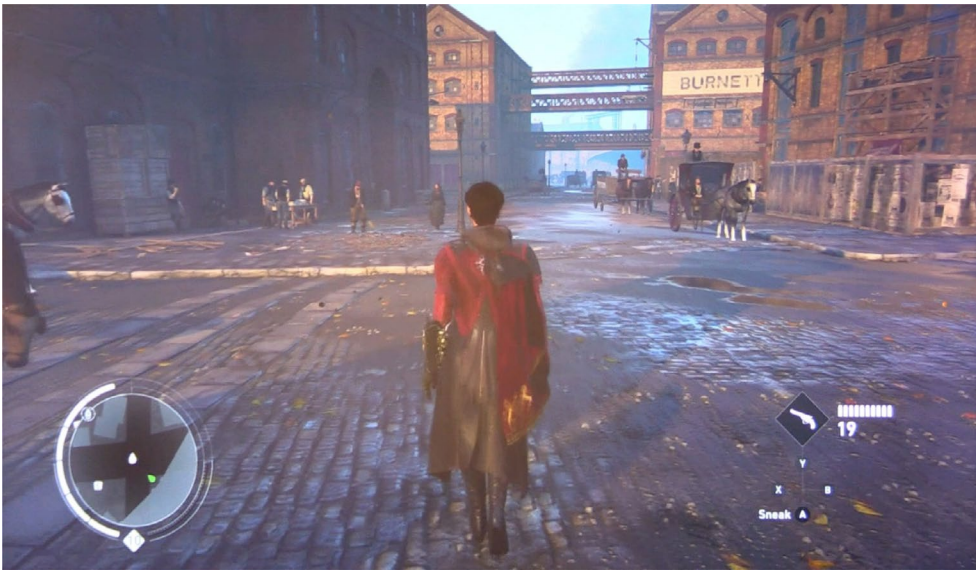
Figure 2. Although the everyday spaces of the warehouse district have an air of gritty realism, they are more the product of the game designers' imagination than the meticulous reconstruction of more famous sites.
Source: *Assassin's Creed: Syndicate*, Ubisoft 2015. Gameplay footage from Participant 06.

photographs and visual art that Hirsch highlights as playing a role in affiliative postmemory.

The last quote above also highlights how an individual's interactions with and understandings of the landscape within the game is very much a product of their experiences and position – in the case of Participant 06, being a researcher interested in contaminated industrial sites. Describing *Syndicate* as 'an *idea* of nineteenth century London' Participant 04, an historical geographer, commented that:

> You can start to see certain architectural types repeated after a while, but yes, it's a pretty good rendering. It misses that fine kind of detail. So it doesn't … actually have the shop names, it'll have 'Bankers' … and those kind of things which… you know, if you were simply using it as a tool of 'let's navigate around nineteenth century London' would become incredibly irritating after a while… but as it's a game, it's kind of, it's that sort of pastiche scenery in the background that you're kind of playing through … (Participant 04, male, 25 August 2016)

Where the historical geographer was irritated by the generic signage ('Bankers'), a political geographer instead compared the game's nineteenth century landscape favourably to the present day:

> Maybe because it's not how London is … It's just so beautiful… There are no standardized signs, there are no chains or shops… I loved the… the fact that, you know, a building with written 'bank' is still a bank. Transactions actually happen in that building… (Participant 07, female, 25 August 2016)

This sense of older, less globalised and generic forms of capitalism held an emotional appeal for this participant, at least in how these forms of capitalism were manifested in the virtual landscape. In contrast to Participant 04, for Participant 07 these elements of landscape increased the sense of being *in* a Victorian streetscape, rather than acting as a jarring note

of unreality. Participants' position is thus crucial to whether a given virtual landscape can combine with an individual's imagination to create a postmemory of that location.

Landscape is a performative co-construction between individual and environment, thereby putting positionality at the heart of landscape creation. Within virtual environments, however, a complicating factor is the ambiguous relationship between the body of the participant and their viewpoint within the virtual environment. This question of viewpoint has a significant impact on how virtual landscapes come into being, particularly where an onscreen avatar is used because it further blurs the line between body and environment. In the *Assassin's Creed* series, the viewing angle of the character on screen is normally from behind and many of our participants assumed the character was male, despite the care taken by the animators to give the character of Evie a distinctly female gait. Indeed, some participants suggested that they would might altered how they interacted with the landscape had they realised the identity of the character from the outset; Participant 13 (male, 5 October 2016) even suggested that he would have taken a less 'aggressive' approach to moving around the virtual city. This potential for identification with the character changes the composition of virtual landscape, from being a co-construction between body and environment, to a co-construction between body, environment and an imaginative engagement with the body of the avatar.

In the interviews, male participants were more likely than the women to talk about the character as being a neutral vehicle for traversing space, for example 'for me I think it's just a tool… It could be a boy. Or old man. It doesn't matter' (Participant 10, male, 25 August 2016). Some (though by no means all) of the female participants, by contrast, indicated a degree of emotional connection with the character, using phrases like 'she's tough' (Participant 02, female, 15 August 2016) and even 'she seemed a bit invincible' (Participant 23, female, 11 November 2016). One participant even commented that:

> I felt embarrassed to stop. I felt embarrassed for *her* to stop on a corner and look around… And I felt bad about doing that. Not in that I thought it was dangerous, but I just thought, 'that's really stupid, poor girl, she has to stand there while I figure out [laughing] where I am'. (Participant 01, female, 15 August 2016).

This sense of embarrassment *for* the character highlights this participant's connection to the landscape experience of the avatar. Although the participant had no material connection to that experience, it nonetheless provoked the kind of embodied, affectual response that Hirsch describes as underpinning affiliative postmemory. Participant 23, meanwhile, was specifically concerned about the way the character *appeared* in the context of London of the time, noting that the red velvet cloaks in which she was dressed were out of line with the hoop skirts worn by other female characters in the landscape. Reflecting on a section of the gameplay footage where she made the character start running she commented that:

> … it isn't like I'm dressed to for a jog … And in this sort of society… I don't know, maybe it's because, maybe I'm influenced too much by having read, you know, historical novels and things. That where any sort of suspicious behaviour by a woman would have them locked up in an asylum in no time. You know, that as a woman you don't just belt [run] around the place! (Participant 23, female, 11 November 2016).

A similar comment was made by Participant 25 (female, 11 November 2016) who, when passing police and other men, wondered whether they would try 'to catch her or something because she looks so different. Like she escaped from somewhere… Whether she lost her

mind…' Both participants were drawing on an understanding of the Victorian period as being hostile to women.

In fact, the gameplay mechanics of *Syndicate* make very little differentiation between the male and female lead characters – both are usually ignored as they pass through 'conquered' territory unless they physically provoke another character. What we see here is that the understanding of what it means to move around a Victorian city emerges not simply from the design of the game environment, but by players' own creative and imaginative engagements with the history of that period. Game designers seek to generate and control emotional and affective responses in players to help generate a game that is engaging and enjoyable (Ash, 2010). It seems unlikely, however, that *Syndicate*'s designers would have expected players to worry that the central character would be arrested for being a woman dressing and behaving in an unusual manner for the period. That the individual player is able to bring these understandings into a highly designed and contrived space, shows the central role of the imaginative in creating the experience of being in such a virtual landscape.

Postmemory works through individuals bringing their imagination to the events and narratives that they do not witness directly. Within that imaginative transfer we see people drawing on real events from their life, such as Participant 05 (male, 25 August 2016) comparing the busy Victorian river of the game with a visit he had recently made to the still active port areas of Hamburg. Other participants layered knowledge of contemporary London into their interpretation of the game's Victorian cityscape. Participant 22 (male, 8 November 2016), for example, had a very narrow knowledge of London based on his student days visiting a girlfriend in Greenwich:

Tess: Were any scenes recognisable to what you understand of London?

Participant 22:   Erm… Just that area, the Mall. And Buckingham Palace. That's where I more or less used to drive right down there and cross Westminster Bridge. And then coming down here I thought 'oh, you know, I need to head in a… you know, in a certain direction.' So I kept on going that certain direction.

Participant 22's navigation strategies around Victorian London mirrored his approach to navigating the real city by car, where he would use a compass to set the direction of travel. This resulted in having a general sense of where he was in the game landscape, without worrying about specific details: 'I didn't know *geographically* where I was, but I knew I'd be crossing the Thames again. But I don't know which bridge'. For this participant, there was an emotional disengagement that reduced landscape to being merely a tool for orientation. Crucially, however, this lack of affective intensity in the relationship with landscape was consistent across both the material and virtual environments – any postmemories generated via the game landscape having a similar emotional coolness to his actual memories of London's material landscapes.

Participant 21 (male, 27 October 2016) had a very detailed knowledge of the areas of London around Downing Street and Whitehall (Figure 3):

At this point I'm thinking, you know 'it all looks very familiar, all the road pattern's the same. This crossroads here, slightly different but basically still there as normal.' … It's one of my favourite parts of London. I did an internship… round here. So I know that area from lunchbreaks … And when I go to London one of my favourite parts is to walk round all these places… I've also got a kind of affinity with public policy and government, so it speaks to me more than, say for example, the east side of the city.

Figure 3. Participant 21 exploring the personally familiar landscape of the government district around Downing Street.
Source: *Assassin's Creed: Syndicate*, Ubisoft 2015. Gameplay footage from Participant 21.

Even though, as he acknowledged, many of the familiar buildings from the modern street-scape had not yet been built, there was a clear relationship here, overlaying a positive affective connection with the present-day space onto the historic landscape of the game. For other participants, the connection to the past was more compelling. Participant 07 (female, 25 August 2016) for example favourably compared the Covent Garden of the game's Victorian landscape with the 'gentrified bakeries' in that location today. There was a risk, however, that those with an intimate knowledge of London could be jarred out of the sense that they were exploring the historic city by their awareness of the compromises being made in creating the game space, for example noticing that the distances between landmarks had been compressed and that key buildings such as St Pancras Station were simplified compared to the originals (Participant 09, male, 25 August 2016).

We set up the gameplay exercise in such a way that participants would experience the landscape of this Victorian city in a 'normal' manner i.e. walking or traveling by vehicle at ground level. Notwithstanding our intentions, *Syndicate* is, ultimately, a *game* and many participants either accidentally or by design sought to engage with the landscape in a less materially realistic, 'gamerly' fashion. Participant 20 (male, 25 October 2016) for example had intended to visit the River Thames before accidentally starting a time trial challenge that required the character to be guided by a series of markers through a course running across rooftops and driving a carriage against the clock. Thoughts of sightseeing disappeared at this point, as the participant sought instead to beat the time trial target:

Phil: And as you're doing this… are you taking in the landscape at all or are you just focused on the task.

Participant 20:   Fundamentally focussed on the task… And so now… it's only really now, talking about it, I actually think 'oh, I'm at the Thames' where I was actually kind of thinking about trying to go at one point. It is very much, at this point [in the gameplay], 'what on earth happened to that second marker? How do I actually get there?'.

Several participants discovered the character's ability to climb buildings, both manually and via a grappling hook mechanism. Participant 14 (male, 30 September 2016) climbed up the Clock Tower[2] on the side of the Houses of Parliament and briefly attempted to hang onto the clock hands. When asked why, he could only answer 'I don't know, I just thought it would be funny to climb up'. Similarly, Participant 13 (female, 14 September 2016), after accidentally deploying the grappling hook for the first time, commented that this made the experience of exploring the city more fun 'Because you're going around a landscape in a way that you can't… normally'. Again, there is a slippage here between understanding this as purely a virtual environment and the game generating second-hand experiences of a material landscape that would otherwise be inaccessible. Postmemories of the view from the virtual Clock Tower, for example, appear to give players some insights into what that landscape experience *would be* like in the material world.

Nonetheless, on an everyday basis we cannot drive recklessly around cities, bashing into things, we cannot climb buildings with superhuman skill and we certainly cannot casually kill people in the street with no consequences. What the comments above illustrate is for all that the landscape of the game evokes connections to a past that can no longer be accessed it is also, fundamentally, designed to be *played* in. Even where research participants are given a set of instructions to simply walk around and collect thoughts about landscape, the mechanics of the game are designed to pull players into particular activities. This was elegantly summed up by Participant 18 (male, 24 October) recalling his thought processes about what he planned to do in the game landscape:

> '…let's not do anything naughty, let's just have a look around.' But … these prompts that come up, they tempt you into… *sin*. [laughter]

These virtual environments become a space in which to experiment with different ways of *doing* landscape that are closed off from material experience. This being said, while the game mechanics do not necessarily *require* players to indulge in behaviours that would be considered extreme in the material world, they certainly channel players towards those behaviours, which has a direct impact on how those virtual landscapes are understood and the kinds of postmemories they generate.

Discussion

In theorising the virtual, Rob Shields (2003) has argued that if people can independently verify the existence of something then it can be considered real. People who engage with different virtual environments, therefore, have *real* experiences that generate *memories* of that interaction. Simultaneously, however, interaction with virtual environments also produces *postmemories* of the material environments that are being simulated within the virtual space.

Our 25 participants possess memories of being asked to sit in a room and play a video game for twenty minutes. Some may even be able to recall details of what they did during their virtual walk. For most, this was an insignificant distraction in otherwise busy lives – a bit of fun that helped out their colleagues. At the same time, despite the details that can break the illusion of being in a 'real' landscape, *Syndicate* offers a compelling sense of being *present* in an historic landscape. Participants therefore also possess postmemories of a nineteenth century London that they can never visit just as Ash et al.'s (2009) participants possess

postmemories of the Amazon's hydroscapes. The virtual landscape acts as a vector of transmission for these affiliative postmemories.

When Hirsch developed the idea of postmemory she was using it to explore the particular traumas of the Holocaust and it has subsequently been deployed to look at a whole series of historical ruptures, from the Boer War (Stanley & Dampier, 2005) to the South American dictatorships of the 1970s and 1980s (Nouzeilles, 2005) and beyond. There is nothing in the concept, however, that *requires* a focus on the traumatic; postmemory simply provides us with a tool for understanding how individuals absorb and interpret experiences that they cannot witness first hand. As such, postmemory is of particular use when examining digital environments because they purport to offer insights to a material world that is difficult or impossible to examine in person. The example we offer here is of a violent videogame – which has unfortunate ironies given the intellectual origins of postmemory – but it could equally well be applied to understanding how trainee doctors build an understanding of medical practice in the material world through engaging with a VR simulation of surgery.

The value of postmemory as a theoretical frame is its emphasis on the imaginative. We cannot know what it is like to experience the Holocaust, but listening to testimony, looking at photographs, visiting sites and so on transmits information to us so that we can *imagine* what that experience *may have* been like. The understanding of the Holocaust generated this way is not solely a product of the vectors of transmission, therefore, but a co-construction with our own imagination. The same is true of virtual landscapes, where the designers' intent cannot fully determine how we choose to understand those spaces.

There are, therefore, considerable issues of power to consider in the balance between designer intent and user imagination in creating the experience of virtual landscapes. Virtual environments tend to be designed with a greater or lesser degree of connection to material environments and with a clear intent to do *work* beyond the purely virtual. This could be selling an architectural vision, visualising the effects of different socio-environmental processes or, in the case of a videogame, engaging and entertaining a consumer. Recalling Lange's windfarm example, a compelling visualisation can be used as a way of concealing material realities of power and compromise. The postmemory of a landscape transmitted through a visualisation has sufficient affective force to potentially generate anger and disappointment where the finished development looks and feels different to the virtual version.

A landscape of postmemory allows for a greater sense of ownership by the individual than the *lieu de mémoire*. Formalised spaces of memorialisation have fixed narratives imposed on them by the designers. Of course these narratives can be subverted, but to do so risks censure – witness the anger and frustration that some visitors exhibit when seeing others playing and taking selfies in Peter Eisenman's *Memorial to the Murdered Jews of Europe* (Faiola, 2017). Postmemory allows the individual to interpret and reimagine that which they are witnessing second-hand. This sense of ownership can create a very different experience within the same (virtual) environment, depending on the position of the individual.

There are questions of scale here. In a relatively small or simple visualisation of a windfarm or a new building, it is easier for the designer to control the user's experience of that virtual environment. As such environments have become more sophisticated, however, they have given a compelling sense of presence *in* a landscape that does not materially exist. This is significant because the kinds of very large and complex virtual environments of games that require multimillion dollar development budgets, rapidly become yesterday's technology,

able to be inexpensively deployed in very different contexts (e.g. Ash et al.'s hydroscapes). As these virtual environments become larger and more detailed, so people can interpret and experience them in ways that the designers did not anticipate. Carefully researching what 1860s London looked like and producing an environment reflecting this research does not stop someone from seeing the quotidian, but entirely imagined, streetscapes as being the most 'historically' engaging part of exploring that virtual city. Likewise, creating a strong female character in response to fan protest does not stop players imagining how such a character would have been treated had she actually walked the streets of Victorian London and thus worrying about whether her costume and behaviour will lead to censure or arrest.

There is, of course, a danger here. Several participants reflected that they had enjoyed the game experience because it gave them insights into everyday life in Victorian London. While there is considerable archive material underpinning the recreation of major landmarks in *Syndicate*, the quotidian landscapes are much more the product of the designers' imagination and the demands of creating a playable game space. Thus, postmemories of Victorian streetscapes generated through the game experience may possess affective force for participants but have variable grounding in material realities. We may *feel* as though we know something about the material environment when we visit its virtual recreation, but that feeling occludes the multiple complexities of that material environment which simply cannot be recreated. This leaves room for the imagination to fill the gaps, but we do not necessarily do this in a manner that genuinely enhances our understanding of those material landscapes that we cannot experience first-hand.

Conclusions

Although the intellectual framework of postmemory emerges from events of extreme trauma, we have argued here that it provides a valuable framework for understanding the kinds of virtual landscapes that are now commonly being used to reshape our understanding of the material world. Postmemory demonstrates how the combination of second-hand accounts and personal imagination can create powerful, memory-like qualities within the individual that alter how they interact with the world around them. Virtual landscapes matter, therefore, because they have a material impact on what we think and do. For many people, *Syndicate* and games like it will significantly shape their understanding of key periods in history, just as a 3D render of a proposed new building can impact on whether or not it is commissioned and built.

There is considerable scope for the individual to co-construct virtual landscapes through personal position, imagination and play, thereby generating postmemories. Thus, while all virtual environments are intended to do work in the material world, the work they do is far from being limited to the intentions of the designers. We have focussed here on the virtual environments of video games, which have unique qualities relating to their scale, complexity and ludic natures. Nonetheless, these insights are significant because the mechanisms of postmemory operate across many different kinds of virtual environment, whether intended for use in architecture, archaeology, medicine, the military or a host of other applications. Furthermore, technologies and approaches being pioneered by the games industry quickly find their way into more mainstream uses.

We argue strongly that virtual landscapes are a co-construction between designer and user, but we end by highlighting the recursive nature of such landscapes. As designers see

how virtual environments are used, they can refine and alter them. It is important, therefore, to maintain a critical focus on the work that these virtual environments are intended to do within the material world. Given the forceful affective qualities of postmemory, the balance of power between designer intent and user imagination needs to be interrogated to explore how individuals are manipulated through their exposure to and co-creation of these virtual landscapes.

Geolocation information

The data collection was undertaken in the space between the virtual environment of *Assassin's Creed Syndicate* and the physical location 52° 27′ 03′, 1° 55′ 59′.

Notes

1. Although it is notoriously difficult to estimate the budgets of individual games, top titles will routinely run into the tens and sometimes hundreds of millions of dollars for development alone. Marketing costs for some games can be even larger.
2. This is the tower that houses the building's iconic clock and is often, if inaccurately, referred to as Big Ben. Big Ben is in fact the nickname for the Great Bell housed in the tower that chimes the hour. At the time the game was set this part of the building was referred to as the Clock Tower, but was renamed the Elizabeth Tower in 2012 to celebrate the Queen's Diamond Jubilee.

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