Purpose in Place:
Discerning and Forefronting Forgotten Landscapes using the Methodological Lens of Augmented Reality

A Dissertation Presented for the
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Lindy C. Westenhoff
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DEDICATION

For the people in the dark-- on an island or in the closet-- still waiting for their first sign of light.

For my parents, my brother, my community.

And for Jocelyn. Always for Jocelyn.

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ABSTRACT

Augmented reality (AR) is an under-studied tool that deserves more academic attention and gaze. By using the built landscape as its point of orientation, but providing a virtual interface with which to engage, the augmented landscape serves as a departure of the traditional digital-physical divide. This realm raises questions regarding purpose and intention, but also has its own limitations and issues with dynamic, complex spaces that change frequently. Each chapter of this dissertation stands alone as a "part" and are structured as individual journal articles – they connect, however, through the use of this technology to answer questions unique to their spaces.

Chapter/article 1 explores the relationship between the virtual, augmented, and physical landscape in a secular sacred space; chapter/article 2 delves into the complications of free speech, street art, and representation; and chapter/article 3 examines a series of data generated by users of AR in order to determine patterns of mobility before and after COVID-19 on the college campus landscape. A pre-chapter introduction stands as a critical overview of the concept of "landscape" within cultural geography, with a particular emphasis on the political and cultural iconography present that is prominent within American landscapes. The conclusions drawn from the work as a whole are discussed following chapter/article 3.

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INTRODUCTION

Landscapes are not neutral.

Physical landscapes have, at times, been interpreted by their users as 'set', spatially and temporally. Settings that exist within a state of assumed neutrality, a step removed from social, cultural, or political action. Mountains, valleys, rivers, and built environment are seen as passive settings upon which human adjustment and adaptation can take place.

In this characterization of landscapes, I fundamentally disagree.

Landscapes are far more than this. As understood within space and place in geography, landscapes are inherently the product of human shaping and development - and humans are never neutral in their intentions of transformation. Richard Schein, a cultural geographer, has famously characterized the landscape as "discourse materialized" (1997), but who generates the discourse? And what remains unmaterialized?

In this dissertation, I discuss multiple scales, versions, and layers to what we consider to be "landscape" across three major locations. Exploration of digital/virtual and augmented landscapes are at the heart of this work, with a focus on those aspects of a landscape that are less seen, but no less relevant. My intent is to demonstrate the value and power, as well as potential areas of manipulation, in using augmented reality (AR) to see landscapes in different contexts. Each chapter examines a different physical landscape: first, a national cemetery in Virginia; next, two sites of artistic and self-expression in downtown Knoxville and the University of Tennessee; and lastly, student-oriented landscapes in and around the campus grounds of the University of Tennessee's Knoxville campus.

The augmentation applied to each landscape is the same via the framework of Pokémon GO, an augmented reality gaming application in which users interact with their real-world surroundings via their virtual in-game representation (referred to, typically, as an 'avatar'). The methodological context in which this type of AR is applied to physical landscapes and interpreted varies by chapter, but each broadly seeks to engage the following questions: *what exists in the space?; what purpose does the landscape serve?; and, who does the landscape serve, as it is articulated?*

When "interrogating" landscapes (in the perspective of Peter Merriman and Tim Cresswell, for example), it is necessary to adjust scope and scale. A study examining national trends will yield different results than one limited to a single neighborhood, and the extent of what occurs nationally is fundamentally different than what occurs locally. This principle holds true when comparing across different versions of landscapes, such as the physical, the virtual, and the augmented.

The augmented concept of landscape only exists in an immediate, limited sense – at a user-friendly level, for player navigation – while physical and virtual landscapes can exist at a multiplicity of scales. When interrogating the augmented, it is therefore often advisable to do so at the augmented sense of scale rather than any other in order to analyze, evaluate, and compare versions of the landscape in – as much as is possible – parallel fashion. Where possible, this work returns to the augmented scale of user-interaction, while also making use of maps, other types of geospatial visualizations, and photographs for broader context.

Each chapter of this dissertation has been crafted to function as its own discrete article, with deliberate adjustments to each in order to enhance their effectiveness as components of a larger whole. Any duplication of contextual definitions throughout is to support each chapter's ability to be read in isolation, although for the purpose of this dissertation they are intended to be read sequentially. The interrelation of concepts across chapters is explored in more detail in this dissertation's conclusion.

In the first chapter, I study Arlington National Cemetery, referred to as Arlington for simplicity's sake, a space and place with deliberate, but often conflicting, purposes – using virtual, physical, and augmented versions of the landscape. Arlington is an active funeral site for military personnel and, simultaneously, a hugely popular tourist attraction right outside Washington, DC. Through the opt-in augmentation of Pokémon GO, this heavily curated landscape is transformed into a liminal space intended for play and recreation; soldiers' gravestones become both player resource and sites of simulated conflict. The augmented landscape becomes 'haunted' by that which is between totally visible and totally invisible (Bell 1997), much as Arlington itself is haunted by complexities of race and racism, national pride and narrative, and the at-times literal erasure of certain narratives. While I had visited Arlington many times in the past – my grandfather was buried there in 2013 – COVID-19 travel restrictions initially limited my ability to return for in-person field work. As a result, I began the work from the perspective of one "outside" the physical space as a virtual visitor, or one who was not afforded with the possibility of seeing the physical whole. Ground-truthing of the physical and augmented landscapes occurred following the easing of travel restrictions, drawing on methodology and concepts from remote sensing. Different 'versions' of the landscape can have wildly different purposes and interpretations thereof. The physical is the basis for the augmented; as such, exploration of the augmented Arlington landscape can result in insights about the cemetery itself, as well as the version of the cemetery that exists only through a smartphone screen. In this way, engaging with the augmented landscape can also reveal and highlight things that were largely missing from other iterations of the landscape.

In the second chapter, originally published as a co-authored article, focus moves to how landscapes are represented in the digital, augmented, and physical landscapes. Using an approach rooted in linguistic landscaping and toponymy as a dual basis, I worked with a colleague to analyze one location on-campus and one location off-campus that, ostensibly, were focused on freedom of speech and complexity of expression. The

sites in question - Artist Alley in downtown Knoxville, and The Rock, a site for painting and self-expression at the University of Tennessee - are spaces in which artists and contributors can voice thoughts and opinions on topics important to them. We worked to develop a framework for thinking of the articulation of augmented sites via their representations within Pokémon GO, and found that, while both sites ostensibly allowed these freedoms, there were deliberate curations present in the augmented landscape that could not be ignored. One site represented in Pokémon GO simply does not exist in the present; the other removed a large amount of context and conflict seen in the site, termed "space-time devaluation."

My final chapter/article takes these previous concepts regarding digital, augmented, and physical landscapes, including their complicated articulations and differing frameworks for understanding, and centers them in the classroom. As part of the course work for classes I taught in the Fall of 2019, Spring of 2021, and Fall of 2021 at the University of Tennessee with myself as instructor of record, I had students complete a "PokéStop walking tour" of their spaces before COVID. With the help of a colleague, I anonymized their responses and collection of data. I then layered these responses in aggregate via data visualization to determine if there were consistent patterns and repetitions that students encountered at multiple venues. By using kernel density analysis to determine where students were most present in the landscape, I found that in the second group of student data, the first to complete their work post-COVID, there was a sense of "uncertainty of place", as Bissell (2020) articulates regarding post-COVID landscapes. This ties back into what purpose a landscape serves - and how the relationship of one to the landscape is fundamentally part of that purpose.

These chapter/articles are different and perhaps unusual, with different sites of study and different uses of the same augmented reality technology in order to look at different aspects of the landscapes present. That said, the Arlington study created a framework for what an augmented landscape could look like in contrast to standard conceptions of space and place; the two-site study took the augmented landscape and interrogated what and who it could be for; and the pedagogical research examined landscapes in student perceptions, establishing definitively that augmented landscapes are, in fact, a new and exciting way to understand the complexities associated with space and place. They stand alone, but speak to each other, in the same way the augmented layers contribute to better understandings to the more-seen landscapes and the norms they present to us.

CHAPTER/ARTICLE 1

AN AUGMENTED HAUNTING: SYMBOLIC ACCRETION AND INTERROGATION OF ARCHIVE IN ARLINGTON NATIONAL CEMETERY

Abstract

Arlington National Cemetery, a military cemetery for the express purpose of burying what Abraham Lincoln referred to in the Gettysburg Address as the nation's "honored dead", is a site in which the presented landscape, to the viewer, is one of a uniform, national sacrifice. This, however, is not accurate – the grounds of Arlington alone are not simply a cemetery space, but previously, a historic mansion, a town created by and for the formerly enslaved, and, perhaps surprisingly, a significant tourist attraction in the Washington, D.C. area.

In this chapter/article, I argue that multiple lenses to landscape must exist and be employed in order to capture and understand the full context of Arlington National Cemetery. I use John Agnew's articulation of space and place, as well as Richard Schein's characterization of landscape, as the starting point in which I conceptualize Arlington National Cemetery as a site of interest. Symbolic accretion and "ghosts of place" further uncovered divergences between different articulations of this singular landscape.

Beginning with a virtual approach due to the global pandemic, I employed basic quantitative coding methods to determine what was, according to the official website content, most of importance. Moving to the physical landscape when allowed, I worked to see what similarities and differences were present between these two iterations of the same site. Finally, I employed a third landscape – that as seen in an Augmented Reality (AR) framework – to better interrogate why and how some features were chosen over others for inclusion in terms of importance, relevance, and prominence. I refer to this third view as an augmented landscape in its own right, as it creates and illustrates the complexities that arise below and aside the dominant narrative as presented in these other landscapes. I discuss three examples of iterations in which the augmented landscape illustrates the need for further engagement and interrogation – that of the Confederate National Monument, the "Lest We Forget" memorial, and the exclusion of the 442nd Regimental Combat Team in remembrance.

Introduction

Death and dying are inherently tied to the human fascination with what exists beyond our lived experiences. While grief and mourning themselves are universal, how the living recognize and commemorate death varies greatly. In the United States, special sanctity is granted to landscapes that inter the military dead, establishing and reiterating a cultural norm of national sacrifice, honor, and unified patriotism. At Arlington National Cemetery (referred to in citations as ANC and in-text as Arlington for simplicity's sake), one of only two sites run explicitly by the United States Army, more than ten funerals are performed a day, and it functions, concurrently, as an international tourism destination, receiving over three million visitors a year as reported in 2022 (ANC, n.d.). It has been designed and curated to function as both sightseeing location and sacred space, to the extent that many who will never visit are, nonetheless, broadly aware of its purpose, function, and meaning in an American and/or military context.

The use of augmented reality provides a different way to understand and engage with Arlington as a landscape. Augmented reality (AR) is a user-generated framework that incorporates physical features as part of a virtual map; this differs from virtual reality in its emphasis on a user being literally present in the physical landscape in order to interact with the virtual features of interest selected (Azuma 1997). The augmented cannot exist without the physical, but the augmented landscape can and does shape the ways in which the physical landscape is experienced by its users. The form of augmented reality focused on in this research is the gaming application Pokémon GO, which delineates sites – known as "PokéStops" – as spaces for interaction and play. Delineated sites range from significant crowd-drawing locations to seemingly random headstones, creating an augmented layer with which only users of the application can engage. While there are certainly ethical considerations regarding the use of ostensibly sacred space as public space, that is not a major point of focus in this work.

Representations of a place are shaped and oriented by overarching narratives, and identifying what those particular narratives *are* informs the purpose and function of the site of interest fundamentally. To understand how Arlington National Cemetery presents itself in narrative and in reality, the dual concepts of Bell's (1997) "ghosts of place" and Dwyer's (2004) elaboration on Foote's "symbolic accretion" were used to interrogate three presentations of landscape - the virtual, the physical, and the augmented.

A range of methods were employed to explore each landscape and its attributes. Starting with the virtual representation of the cemetery, a basic content analysis based on word frequency and an index of "notable memorials" were created to determine particular areas of interest and importance in the representation of Arlington National Cemetery online in official website pages and documents. While there were references to particular aspects of all three motto pieces of "Honor, Remember, Explore" on the website, visitor engagement was not the priority - rather, commemoration and funerary arrangements were more prominent. The analyses from the virtual representation provided a starting place of understanding, but walking the landscape was also necessary; once safe to travel, "cultural ground-truthing" was necessary to identify differences between the

representations in virtual and physical spaces. That is not to say a physical space should be considered more accurate or perfect - rather, it is a different imperfect representation based on a different set of narrative components. I visited the cemetery on two separate occasions to engage in this ground-truthing initiative.

Arlington National Cemetery presents itself as a fairly monolithic space, to the potential detriment of those who are, in deliberate and unintentional ways, erased - even if there is a physical or virtual presence that could be recognized. While the focus remains on monuments and memorials as representation, individual subsections of the cemetery, such as Sections 27 for its history associated with segregation and 60 with its association with ephemera, have a largely-minimized presence in person and on the Arlington National Cemetery website, even though they are very much present in the physical space of Arlington National Cemetery. Symbolic accretion, originated within Foote and expanded on by Dwyer, refers to how monuments that already exist are often imbued with additional, complicated meaning (Dwyer 2004, p. 420; Foote 1996, p. 232). This is often a visible, deliberate process - but sometimes, that is only visible to a select few who know of the site or landscape's existence. In essence, this is what Bell (1997) refers to as "ghosts of place".

Within Arlington National Cemetery, the augmented features of interest, highlighted through the AR application Pokémon GO, can be treated as a dynamic archive from users of the application. These "archive entries" were more detailed, more complex, and more diverse - with an eye towards racial military history - than what was presented in either the physical or the online representation of Arlington National Cemetery. Pokémon GO did not just supplement what was provided; rather, users playing GO provided new, and ignored, content to this landscape by considering what was "of interest" and what was not. With Pokémon GO, power, representation of people groups, and hidden histories were made apparent through identification and recognition of such sites - and yet, as this is an optional landscape only for players of one particular game, it is only partially present. I term this "augmented haunting" - only those who opt into this third landscape and choose to engage with these ghosts of place are those who are seeing and understanding the complexities outside the sanctioned narrative of formal, uniform sacrifice, as presented in the physical and virtual representations of Arlington.

This study is guided by several fundamental questions: how do different landscapes present different narratives at Arlington National Cemetery? What is the dominant narrative as presented in each landscape? Why are sites of commemoration ignored or suppressed? Finally, how can those narratives only seen in the "haunted" realm be recognized, and eventually, potentially, laid to rest?

Site

Arlington National Cemetery in Function and (Per)form(ance)

Tucked against the Potomac river to the east and ringed by highways and military infrastructure in every other direction, Arlington is an unusually green space within the

largely urban Washington, DC metropolitan area. Once the home of the Lee family of Confederate infamy, what is now the Arlington grounds was seized by the Union during the American Civil War as a strategic high ground. What was once the Lee family manor stands today as Arlington House, The Robert E. Lee Memorial (hereafter, Arlington House) under the jurisdiction of the National Park Service, while the remainder of the grounds are administered by the United States Army.

The first of the "honored dead" were laid to rest in the grounds beginning in 1864. Originally consisting of 200 acres, Arlington has expanded to over 600 acres as of 2010, with the cemetery boundary now pressing up against Joint Base Myer-Henderson Hall, a military complex immediately to the west. Paved roads separate cemetery sections, numbered 1 through 76. Headstones prior to 1947 were not standardized; thus, older sections of the cemetery feature obelisks, shrouds, and angels incorporated into their designs. For present-day burial, the iconic two-foot white marble headstone is the only option, as seen in Figure 1.1.

Each headstone has its section and location information etched on the back; occasionally, other information will also be etched there, such as particular service performed. Serving as one of the original flag raisers on Iwo Jima during World War II, Rene Gagnon was honored with an additional plaque showing the raising action, along with a brief epitaph: "for God and his country he raised our flag in battle and showed a measure of his pride at a place called Iwo Jima where courage never died". One of Gagnon's fellow soldiers at the Iwo Jima raising, Ira Hayes, was one of the most well-known Native American soldiers to be buried at Arlington. His untimely death at the age of 32 was framed in contemporary media as a consequence for "his inability to control himself, to fully master his own nonwhite body" (McElya 2016, p. 226). Unequal representation in death as well as life for the honored dead is explored more significantly in McElya's *The Politics of Mourning,* focusing on the history and complexity of Arlington from its origins before the Civil War to the present.

Memorials are sites of collective focus, while headstones honor specific people. The major attention of this chapter is on memorials due to their representations of groups; however, certain sections of the cemetery that feature all or mostly headstones can also represent sites of collective focus. Section 27 and Section 60 are two such areas in Arlington that warrant mention in this vein of thought.

Until the late 1940's, the only place in Arlington in which African American military and civilian personnel were permitted to be buried was Section 27. The acreage of this section is far to the cemetery's north, and it is one of the sites of oldest use in the cemetery's broken ground, preceding the seizure of the land from the Lee family. Service members of all races and Black civilians were among the first to be buried there; however, the section was segregated at the turn of the 19th century (ANC, 2022) in what Ric Murphy calls a deliberate action of white supremacy (2020, p. 166). Black veterans interred in Arlington were strictly buried in Section 27 until 1948, when the National Association for the Advancement of Colored People (NAACP) demanded the section's re-integration (McElya 2016, 213). No signage in the physical landscape



Figure 1.1. Headstone of Rene Gagnon. Taken by author.

recognizes the historical and cultural significance of Section 27, nor does the official map of the cemetery on the Arlington website explicitly reference the area in any fashion other than as its numerical designation. Another historic site that exists within the cemetery's grounds without considerable memorialization is Freedman's Village, which was once the location of a largely self-regulated and maintained settlement established by "contraband" Black Americans during the Civil War. The majority of residents were financially displaced by the late 1880s after the Army desired the land on which the Village existed (Murphy 2020, 152). While the official Arlington website does have a page on both Section 27 and Freedman's Village, the information provided is limited in scope and characterization (i.e., less than 200 words apiece), and is located in somewhat obscure and unintuitive locations on the cemetery's website. Reforms and improvements undertaken in the 1990s, such as replacement of broken headstones, did not result in or include the addition of signs or markers for either location.

Section 60 is to the southeast of the cemetery grounds, and is perhaps the area of the cemetery of most modern controversy in forms of remembrance. Those buried in this section are largely service members killed in modern action such as Operation Iraqi Freedom, Operation Enduring Freedom (Afghanistan), or Operation Inherent Resolve (Syria), rather than, as in the majority of other sections of Arlington, military retirees who passed at an advanced age. Many of those killed in action have family members who still routinely and regularly visit, and leave mementos, photographs, coins, stones, and other memorabilia – which, for lack of a defining term in literature, I deem "ephemera". Per Greg Jaffe, the official response from Arlington was one of complete erasure: the first wholesale cleaning of Section 60 included removal of "the photographs of young soldiers…the balloons, too, and love letters, the sonograms and worry stones, the crosses and coins" (2013). Families of those interred responded with grief and frustration that such a "cleaning" was not mentioned to them. Section 60 is mentioned on the official Arlington website, but only under the subsection on "visiting a gravesite" last updated in September 2022. Further search revealed a single news bulletin from 2013 detailing how these ephemera would be removed and destroyed in an effort to "maintain the dignity and standards of a National Cemetery" (ANC, n.d.). Journalist Robert Poole describes the former landscape as "a sanctuary for private ritual, intense pride, and occasional solace" in his exploration of Section 60 (Poole 2014, p. 111); he also characterizes the need for such remembrance, as "until something more permanent is established, Section 60 will function as a memorial for…families who want to remember those who are gone, and for citizens to see that the war goes on at Arlington, which continues adding graves" (p. 111). He further describes the half-hearted effort the Arlington National Cemetery administration offered to upset and grieving families in a closed-door meeting – allowing "handcrafted" items (p. 115), and disallowing anything else.

Headstone ephemera at Arlington is a microcosm of conflicting functions within the cemetery's literal landscape. The leaving of items atop and in front of headstones is practiced globally, with cultural and regional variations, as a form of mourning. The leaving of stones on grave markers in remembrance is commonly practiced in many subsets of both American Jewish and Native American traditions, and during the



Figure 1.2. Challenge coin left atop a headstone. Taken by author.

Vietnam War and after, currency in coins left atop a headstone indicated meaning, according to many veteran traditions (Veterans Affairs Montana, n.d.). A more explicitly defined version of this tradition is that of "challenge coins". Depicted in Figure 1.2, a challenge coin rests on a headstone, most likely having been left by someone who served alongside the deceased during their tour of duty. While the origins of challenge coins are not fully determined, they have been part of international military tradition for at least a century (Lange, 2017, for example). One of Arlington's imperatives is to serve as a space to inter the dead; another is to provide its visitors with a deliberately curated experience. In the removal of headstone ephemera, a homogenized landscape reiterates a sense of sameness: a uniform sacrifice given, and a uniform tribute given in honor of that sacrifice.

Since its inception, Arlington has undergone several iterations of function as a national cemetery for military personnel – though civilians have also been interred there at certain times and in specific situations. There are over one hundred national cemeteries in the United States alone, alongside state veterans' cemeteries and overseas cemeteries. Most are administered by state-level Veterans Affairs departments. In contrast, Arlington is one of only two national cemeteries administered by the United States Army itself, under the Office of Army Cemeteries. As such, Arlington is allowed to determine its own rules to a greater extent than most other comparable sites.

The rules are also different for Arlington in regards to its most complicated component - tourism. Over three million tourists pass through the Visitor Center at Arlington per year (ANC, n.d.). Signage inside the Visitor Center is in English and Spanish, but outside in the cemetery grounds, signage is in English only. Trams and tours are run by one civilian tour company contracted by Arlington National Cemetery and conducted in English; unofficial walking tours conducted by other guides, and warned against in the Visitor Center, occur in the grounds as well. While parking is paid, visiting the space itself is free. There is a WMATA subway metro stop within walking distance of the entrance. Approximately thirty burials are performed daily alongside and around official and unofficial tours. Nothing prevents tourists from watching or engaging with a funeral in limited fashion, though this is in practice a rare occurrence.

Though not a funeral rite, per se, the Tomb of the Unknown Soldier and the Changing of the Guard can also be considered cemetery practices that also serve as tourist attractions. The Tomb of the Unknown Soldier is self-described as Arlington's most iconic memorial. Its function is highly symbolic: created in 1921 in the aftermath of World War I, the Tomb of the Unknown Soldier was created with the intent to "bring home the body of an unknown American warrior who in himself represents no section, creed, or race in the late war and who typifies, moreover, the soul of America and the supreme sacrifice of her heroic dead" (ANC, n.d.). No body is laid to rest within the above-ground Tomb since human remains are largely DNA-identifiable at this point in time, but it is guarded, with great pride, seven days a week, 24 hours a day. Ritual and narrative, especially in regards to patriotism, are structural to Arlington's purpose, function, and orientation as a space. There is a scripted, precise instruction from the

supervisory officer as the watch moves from one soldier to another in order to have an uninterrupted patrol. Every movement, whether it be foot, hand, weapon, or uniform, is layered with intense meaning, and exaggerated to the point of pastiche. This Changing of the Guard serves as both an act of reverence, but simultaneously, a reinforcement of monolithic, perfect "sameness" that Arlington strives to maintain and present to the public, and a spot on which the gaze of the tourist rests.

Frame and Lens

Place and Symbolic Accretion

Place is a fundamental starting point across the entire discipline of geography. Without place, context and location are nothing, without purpose. Site selection is therefore crucial in establishing the range, scope, and context of a geographic study. Despite the fundamentality of place to geography, the concept is complex and can, at times, be problematic. Every geographer works with a different set of assumptions regarding what constitutes "place". In this chapter, I use John Agnew's characteristics of place and Schein's conception of landscape as the two orienting definitions and frameworks.

Agnew argues that there are three fundamental characteristics that define a landscape as place - location, locale, and "sense of place" (1987, p. 28). Location refers to specific characteristics that separate one physical environment from another. This can constitute literal visible differences, such as regional sports team colors being displayed in one place and not another, or more obscure, such as demographic or linguistic diversity present in particular neighborhoods. By contrast, locale does not focus on a large picture, but refers instead to everyday interactions that make a place active. "Sense of place" is perhaps the most difficult to quantify, referring to the deep attachment that human beings feel in relation to specific places. Emotions, however, are messy. No individual's sense of place is the same as another's. Visceral senses of a place -- smells, sounds, visual cues, memories -- are captured within this third category. The landscape at Arlington is, similarly, visceral and deeply individual for those who visit; Pokémon GO creates an opportunity for features that resonate to be highlighted and appreciated by others, especially if they are obscure, and create a more complex, full sense of place. While physical characteristics such as river features or mountain faces are perhaps more common to think of as "landscape", Yi-Fu Tuan describes it as "a construct of the mind as well as a physical or measurable entity" (dialogue within Merriman et al., 2012). In the context of this work, the built landscape, constructed and conceptualized for humans, is the one in question. I therefore use Schein's definition of a cultural landscape as "discourse materialized" (1997). Discourse requires more than one human for its creation. Often, it requires many. Locale and location inherently interact with discourse, particularly within the context of narrative and structure. They can be in harmony or conflict with one another, and similarly, in harmony or conflict with the landscape.

I consider sense of place and landscape even closer kin, as they both implicitly involve emotional contexts and connections. Humans attach meaning to many elements

of landscape, from kudzu being considered a symbolic representation of resilience in a vine-choked South (Alderman, 2010) to flowers and other ephemera left at temporary memorials to victims of gun violence (Doss 2010, p. 70). These pieces to a landscape, and the attachment humans bring with them, create opportunities to complicate the narrative, or for particular narratives to be forefronted in an effort to maintain a "sameness."

One aspect of meaning-making conducted through landscape and sense of place is through symbolic accretion. This term was originally coined in Kenneth Foote's *Shadowed Ground*, describing the narrative of the origins of the state of Texas as

> *"...not wrong, only misleading…in this form, the story fits ever so neatly into a broader mythologized vision of the American past. ….in effect the battlefield has become a repository for other* ***memorials that help to reinforce its status as a meaningful place****"* (1997, pp. 231-232, emphasis added).

Similar concepts are seen in meaning-making from other scholars within memory and place studies, such as Alderman (2000), Connerton (2010), and Tyner, Inwood and Alderman (2014), examining, in particular, place names in connection to memory. Taking symbolic accretion itself a step further, Dwyer argues that it is "possible to identify a politics of memory associated with symbolic accretion… marked by two oppositional moments of accretion: allied and antithetical" (2004, p. 241). An allied version of symbolic accretion would be in line with current historical and cultural memory; an antithetical version would be in direct opposition, or in revision, to current historical and cultural perception regarding a feature or representation. Alderman's work to document and illustrate issues of racial and social inequality in the framework of street names associated with Dr. Martin Luther King, Jr., revitalized the field of toponymy within geography, and directly uses theory related to and in parallel to symbolic accretion in both its forms. Tyner and Inwood, in collaboration with Alderman, take these concepts to other destinations and features in the American South, such as Greensboro, North Carolina (2014). Connerton's gaze lies outside the United States, but these questions about how meaning-making can be reinforced or reiterated by a societal or cultural norm are echoed there also. If the term is not used, the concept of symbolic accretion is nevertheless reiterated in these critical considerations of place, memory, and power.

Pokémon GO and Augmented Landscapes

The concept of augmented landscapes derives from augmented reality (AR), a technology using elements of both the virtual and physical site to create an opt-in informational layer for the purposes of exploration, recreation, and exercise. AR requires three components: 1) a combination of real and virtual features; 2) an interactive element in real time; and 3) registration in three dimensions (Azuma, 1997). This differs from virtual reality, which it is often compared to, in significant ways - it *requires* the user to interact with the physical world, and therefore, the spatial aspect is very much integral to augmented reality. AR also does not require special equipment, and can be analogue in nature as well as digitally constructed; perhaps the simplest example is the use of glass

overlays at historic sites to demonstrate what a historic feature, now degraded, may have looked like in its past.

Pokémon GO, a mobile gaming application developed by Niantic Inc. (formerly Niantic Labs, hereafter 'Niantic'), is the most well-known example of a mobile game oriented around AR usage. Users of Pokémon GO are required to physically move in space in order to progress in the game; while they move, their virtual avatar does as well, and using the virtual environment around them, real-life features are highlighted as sites for interaction. For example, a historic statue may be overlooked or not particularly relevant to the average person walking by on their commute, but if one is playing Pokémon GO, that statue now has a different purpose and meaning - as a site for in-game resources, and potentially as a site to catch rare Pokémon. Selection for these features within Pokémon GO is of particular interest and complexity, and serves as a type of archive for the players who frequent particular landscapes. One complication that arises immediately, however, is that only those who play the AR game will encounter these augmented landscapes and, thus, the resulting archive.

If the augmented landscape is only visible to some based on the opt-in aspect of access, Bell offers "ghosts of place" (1997) as a way to think of these liminal landscapes. He argues that place should have a term for that which is between totally visible and totally invisible, and offers "'ghosts' of place as such a concept in between. …I use the term here in the broader sense of a felt *presence*…that possesses and gives a sense of social aliveness to a place" (1997, p. 815). The connection of sense of place, landscape, and these ghosts of place are what make the augmented landscape a haunted one. Therefore, the augmented archive does not just recount what is marked as important to those playing a certain game, but often recounts that which is not otherwise visible, serving a much more complicated purpose.

Fieldwork and Results

Virtual Landscape

Due to pandemic travel restrictions, data collection began in the virtual rather than physical landscape. A text-based content analysis was performed on the official website pages for Arlington National Cemetery (ArlingtonCemetery.mil) in the spring and fall of 2020. Headers for the website sections are shown in Figure 1.3.

A basic coding scheme assessing frequency of terms and related concepts was utilized in order to determine the priorities of the Arlington website, as well as areas of interest and importance. Lack of text-based content, as well as blog-style content not published by the official Arlington entity, were both criteria to exclude individual pages of the Arlington website from further text-based analysis. The initial analysis examined 213 pages of the Arlington website, ranging in topics from Visitor Etiquette to details on the selection of trees for the Memorial Arboretum. The information in Table 1.1, found in the appendix, consists of the most referenced terms and groups of terms on the Arlington website, based on frequency of use. Words that mean similar things in the English language, or that refer to similar concepts, were grouped. Certain textual repetition, such

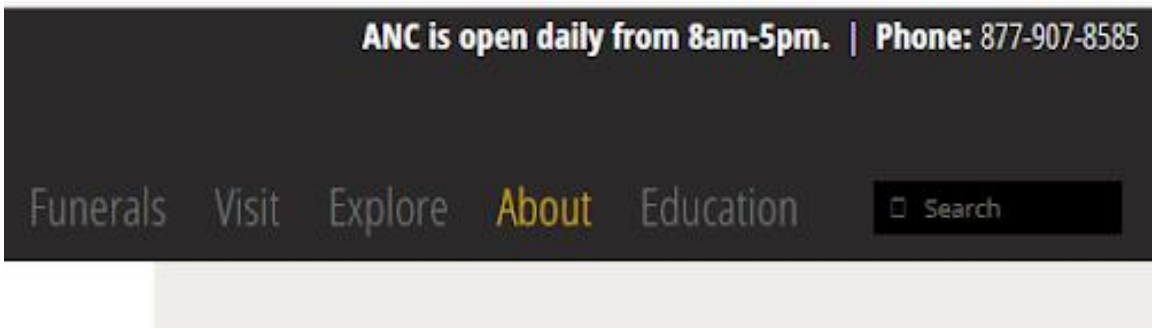


Figure 1.3. Major informational groupings on the ArlingtonCemetery.mil website: Funerals, Visit, Explore, About, and Education. "Education" is external to the cemetery site and was not included in data collection.

as the headers and footers, were also not recorded as "new" for each page examined and were eliminated from the textual dataset. With respect to the grouped categories, "Funeral" includes "procession" and "burial"; "Admin" includes "mowing" and "parking"; and "Tourism" includes "map" and "visitor".

While these terms could be used in different contexts -- visitors could, for instance, be referring to those visiting for the purpose of a funeral – it provides a rough sketch of the content and focus of Arlington's official online presence, at least in terms of frequency of word use. Overall, funeral-related text superseded all other categories.

Once the initial text-based analysis was complete, I reviewed and tallied the images displayed on each page; most web pages had at least one image, if not more, though there were many duplicates. A total of 130 images were sorted and categorized into similar groups, seen in Table 1.2 in the appendix. Images were not counted as "unique" if the same image, duplicated or resized, was used on multiple pages of the website. Images of the same subject or location from different angles were counted as "unique". Similar to the text-based analysis, images were grouped into categories, with a comparable amount of overlap wherein images, rather than words, could be counted among multiple categories.

Perhaps of most note in terms of their relationship to the website's text-based content were those images associated with tourism. Many of them are from the portion of the website devoted to "visit" - but almost all of them are in relation to what tourists are instructed not to do. For instance, bicycles are not allowed within the grounds of Arlington. That textual message, shown as Figure 1.4, is accompanied by an image of a sign depicting a bicycle with the red "no" sign plastered across it. The extra emphasis approaches admonitory, an effort to enforce Arlington's rules to the letter before visitors ever set foot on its grounds.

The virtual landscape presented by Arlington's official website is one of uniform and deliberate messaging. The majority of the focus is on funerals, rites, and reverence – its role as an active military cemetery is described as Arlington's "primary mission" (ANC, n.d.), noting that placement of monuments and memorials has had to be limited as they reduce the amount of land available for laying the dead to rest. In practice, other important aspects of the space continue to exist outside and in relation to those more formalized, ritual uses of place.

Once physical data collection was possible, an element of Arlington visibly emphasized and centered to a similar degree across the virtual, physical, and augmented versions of its landscape is that of monuments and memorials. Thirty-six such features with individual pages are listed under "Monuments and Memorials" in the "Explore" subsection, the landing page for which heavily features monuments and memorials as sites of virtual – and, ultimately, physical – features of interest, shown in Figure 1.5.



Figure 1.4. Banner image on the bicycle use policy at Arlington National Cemetery.

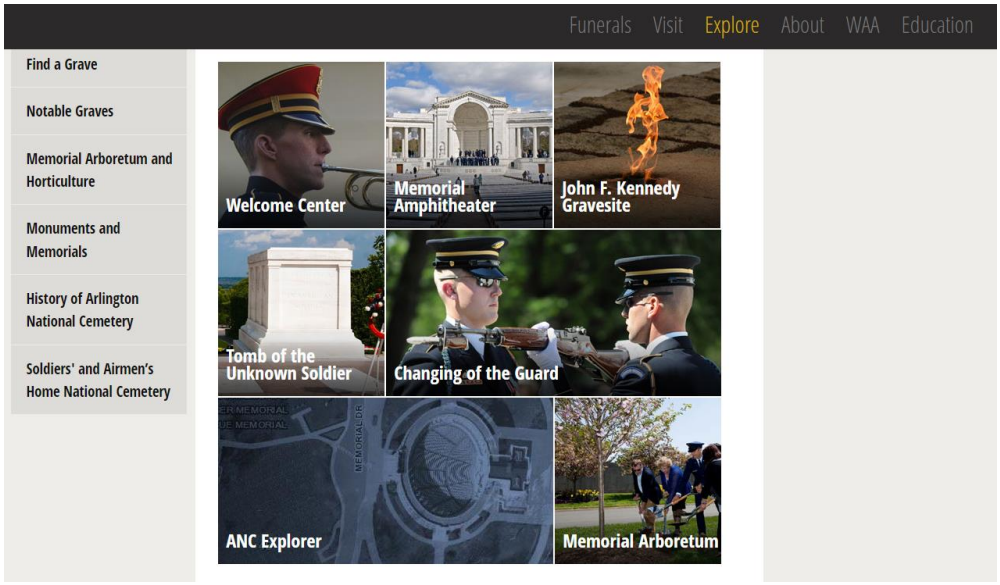


Figure 1.5. The "Explore" section of the official Arlington website, featuring multiple images and links about monuments and memorials.

Parts of the cemetery where those who have been laid to rest have not been memorialized are at a comparative disadvantage, insofar as attracting visitors and interest relative to those that have been categorized as worthy of inclusion on the "Explore" section. This has implications for both Section 27 and Section 60, which are mentioned in passing on the official website, but have – for very different reasons – no monuments to mark their significance.

Federal law limits and provides strict criteria regarding the installation of new monuments, including that 25 years must have passed since the event being commemorated. Policies and laws regarding what can and cannot be memorialized also raises an implicit question of when, if ever, monuments that challenge modern moral standards should be considered for removal.

Physical Landscape

The physical site of Arlington was visited twice for ground-truthing purposes, both times without involving a tour of the space from official or unofficial sources. In 2021, I traversed the site with a colleague; in 2022, with a family member. Neither time involved a tour of the space from either official or unofficial sources.

Walking the landscape at Arlington is physically demanding; Arlington House sits atop a hill in the western part of the space and the remainder of the cemetery is largely oriented downhill from that physical feature. The Visitor Center sits to the east, and while there is transit service, it is only available through the contracted tour group trams. Over the course of two days in October 2021, I walked the majority of the pathways that spanned the cemetery's 600 acres. In October 2022, I walked a small portion of the space to follow up on previously observed details – specifically, whether or not the Confederate Monument remained inaccessible as a result of "renovation efforts". Most of the sites and features listed on the Arlington website as "memorials and monuments" were located. Table 1.3, listed in the appendix, categorizes their section within the cemetery grounds and their ease of location. Most, if not all, were located and accessible. While an imperfect term, "ground-truthing" is intended to convey the verification of landscape for accuracy against the real world in much the same way as its statistical equivalent by affirming that physical reality matches an accounting of it. The official map of Arlington listed on the website indicates some of these memorials, but not all of them. Figure 1.6 shows the distribution of all listed memorials.

Experiencing the monuments and memorials spatially for the first time, and now prepared with information and context garnered from exploration of its virtual landscape, several observations are immediately available.

First, many monuments and memorials are clustered near the Memorial Amphitheater, to the point of necessitating an inset map in Figure 1.6. It can seat 5,000 and hosts events and wreath layings throughout the year, and is also the site where the honor guard outside the Tomb of the Unknown Soldier marches. As that particular portion of the cemetery is more associated with foot traffic, it makes logical and logistical

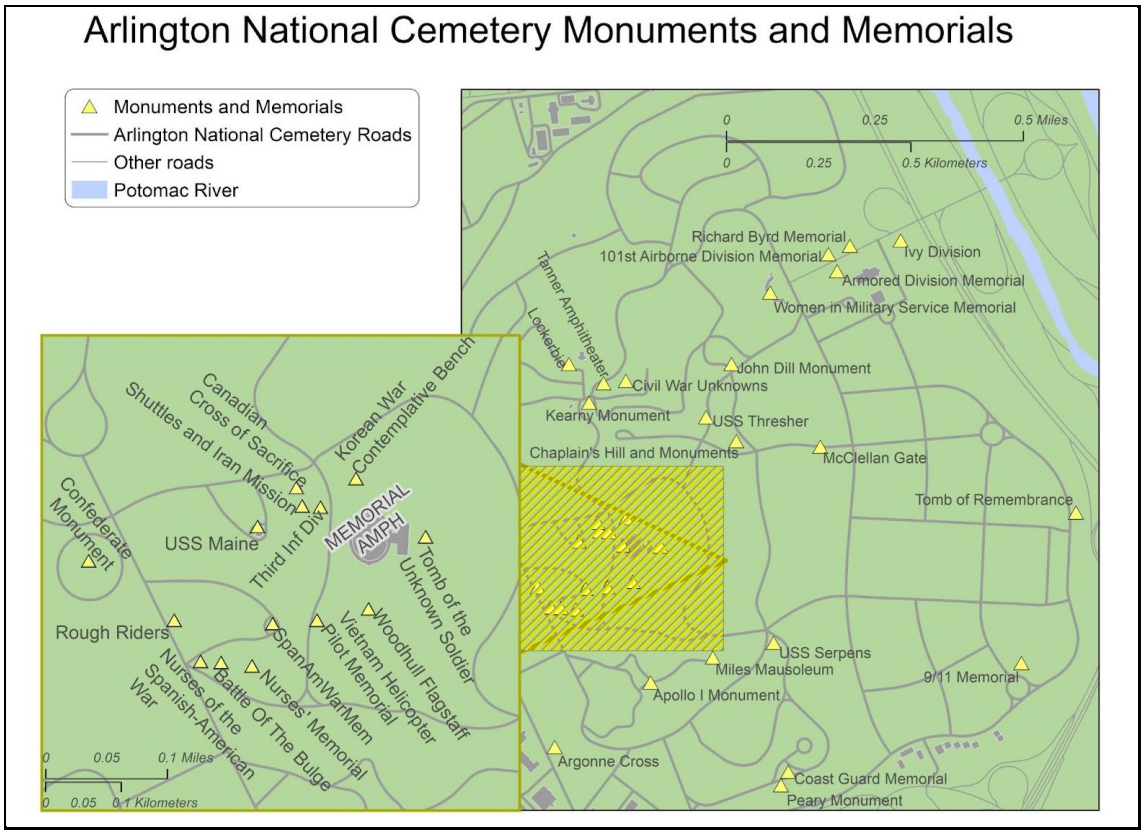


Figure 1.6. Map of all monuments and memorials listed on the "Explore" page mapped spatially. Yellow shading indicates the inset map to the left. Cartography by author.

sense to highlight features close to the cemetery's major draws. Thirteen of the listed monuments are extremely close together. While not all of them were immediately identifiable or even found, such a concentration of features can convey real or perceived implication of potential importance relative to more far-flung counterparts.

Some of Arlington's monuments and memorials are clear outliers, whether that be spatially or in their exclusion from the cemetery's official guide map. The Beirut Bombing monument is excluded, but the USS Thresher Monument is included, despite this latter monument being dedicated years after Beirut. Others are perhaps excluded for visual clarity. No signage related to either Section 27 or Section 60 was identified on-site in the physical landscape.

For its corporeality, the physical landscape at Arlington National Cemetery is not wildly different to its virtual equivalent, but some major differences do exist in how they function. The language used regarding respect is much more explicitly commanding in the physical landscape, and while there are fewer informational components to the landscape, aside from infrequent plaques, the overall narrative of honoring these dead is very much present. The tram tours in the space are perhaps the largest discordance to the otherwise somber landscape. Tour guides that operate these trams work for Arlington National Cemetery Tours, a subsidiary of the entertainment company Historic Tours of America. They provide self-described "provides historically oriented vacation experiences" through the operation of "trolleys, street trains, high speed ferry, themed retail stores, festival marketplaces and other historic tourist attractions" (Historic Tours of America, 2022). Anecdotally, while walking Arlington's grounds, I overheard a visitor grumble about the way the tour guide was narrating over the tram speaker as "Mickey-Mouse-ing". The guides who perform these tours are not servicemembers, but – per the language of their parent company – "cast members". Mickey Mouse indeed. Tourism is not depicted, in the physical or virtual space, to be of particular importance to Arlington itself. However, the features *for* tourists are there, and thus, it is implicitly being acknowledged that this is at least partially a space for tourism.

An Augmented Landscape: Looking Through the Lens

Engaging with the augmented landscape requires assumptions, as discussed previously. The userbase of any game will not consist of all visitors to a site or place, and thus, there is already a filtering effect in place; one must, for example, own a smartphone in order to play Pokémon GO and see which features of the landscape features with which to interact. A small but growing body of literature focuses, also, on how there are cultural and societal norms that can cause players of color, in particular, to feel or truly *be* unsafe in certain circumstances (Lee et al., 2023; Tekinbas, 2017). Thus, what is recognized as "important" may not be so for everyone who is in or uses the particular landscape.

Examples of an augmented landscape may also be more difficult to envision than a physical or virtual one. A valley is a physical landscape, while a website is a virtual

one. In augmented landscapes, the base information are located and navigated physically; however, the majority of the content available for the user to interact with is virtual, only existing with the use of the application. For instance, roads and green spaces that exist in the physical space are represented in-game, but features of interest such as signs, memorials, and buildings must be indicated as relevant to be included. As a user walks the physical landscape, the virtual map updates accordingly. This once again reflects the liminal nature of the augmented landscape, in that it exists between, and at the same time, outside, both typical considerations of landscape in virtual and physical characterizations.

An in-game screen capture, taken in Arlington National Cemetery, demonstrates this in Figure 1.7. All the blue diamond shapes visible are points of interaction, referred to as PokéStops, which correspond to real-world points of interest – in the case of Arlington, often monuments and memorials as well as individual graves. In order to fight and capture Pokémon, the user must continually interact with as many of these features of interest as possible. As such, the existence of each PokéStop represents a feature in the landscape that has been marked as important and now serves as a point of in-game infrastructure and engagement.

While exploring and ground-truthing Arlington's physical landscape, it became clear that many – but not all –of the sites marked as features of interest in the augmented landscape overlapped with the "official" list of monuments and memorials as listed on the website. A cross-referenced table of these features is contained in Table 1.4 in the appendix to showcase which features are or are not represented in the augmented landscape. When ground-truthing these sites as part of the exploration of the physical landscape, features of interest in the augmented landscape were routinely observed as not listed as part of the memorials and monuments on the official Arlington website, but were sites of impact and relevance. Individual headstones and grave markers make up a sizable contingent of additional PokéStops within the cemetery's grounds, as do section markers that identify broad areas of the cemetery.

Most importantly, the augmented landscape of Pokémon GO provides more information to the user regarding certain individuals or sections than Arlington itself provides in the physical landscape. Section 27 of the cemetery, as discussed previously, is the final resting place of about 1,500 members of the United States Colored Troops (USCT), the first black combat soldiers of the Civil War, and approximately 3,800 freedmen, referred to as "contraband" during the war. No signage marks this in physical space, but this information is freely available in the augmented landscape through the lens of Pokémon GO. An in-game screenshot of Section 27 is shown in Figure 1.8.

This differentiation between context available in the physical landscape and the augmented landscape highlights a central element of the augmented landscape – that information is being presented to the user from *somewhere*. This begs the question - who influences or makes decisions about what information is or isn't displayed?

Niantic's first game title, Ingress, also a free-to-play AR mobile game, relied heavily on data from Google Earth as well as input from Ingress players to determine



Figure 1.7. Screen capture from Pokémon GO. All blue diamonds are representative of real-life features of interest with which the player can interact in order to advance in the game.

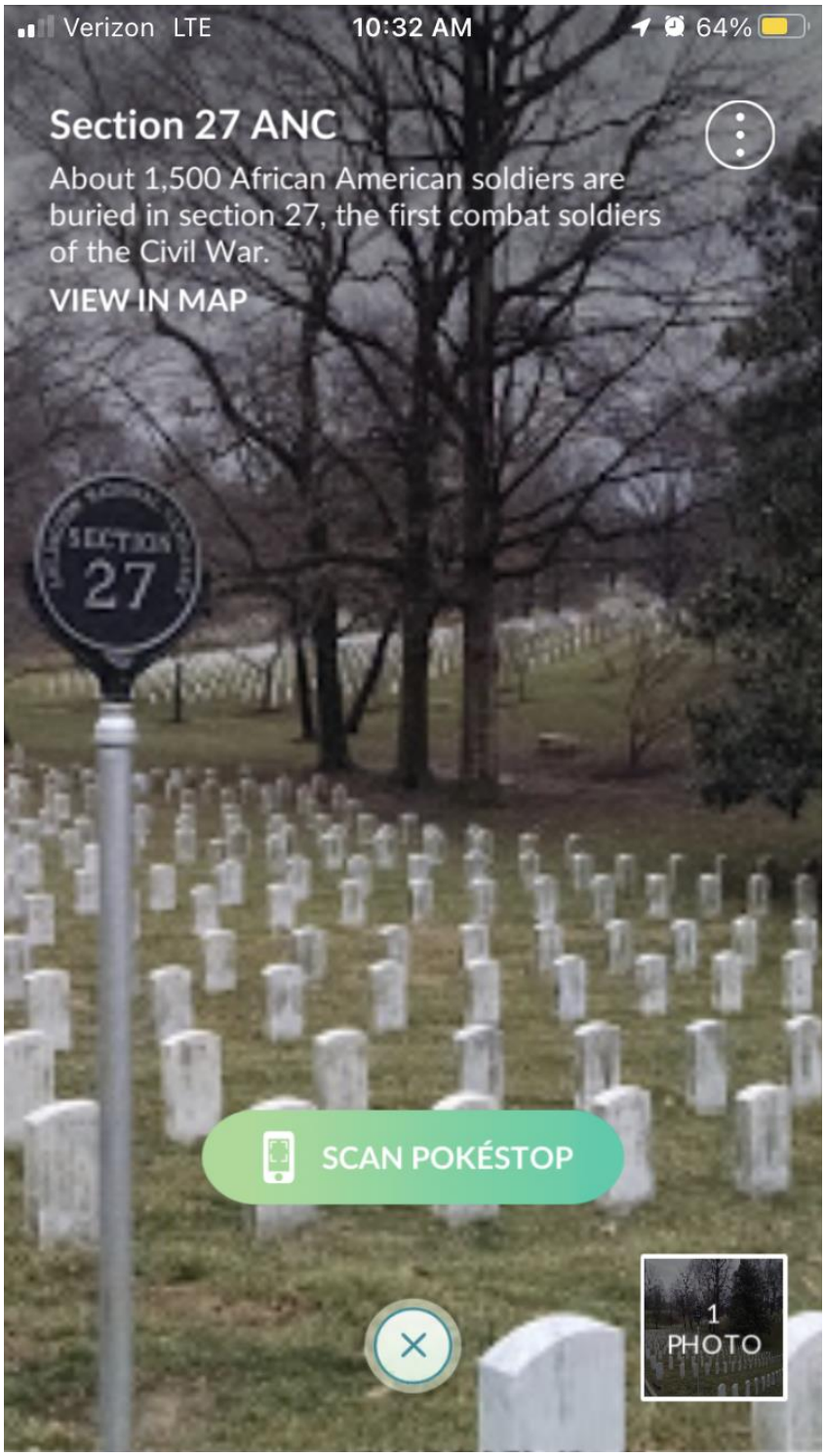


Figure 1.8. Section 27 in Arlington National Cemetery, as seen via Pokémon GO.

which physical landmarks would become augmented points of interest, and this dataset was ultimately used as the starting point for Pokémon GO. In this way, the foundational dataset upon which Pokémon GO is based is both corporately-curated and user-influenced – though notably, influenced *first* by users of other applications that use such geotagging practices. The data visible through the "lens" of Pokémon GO's AR is therefore governed and/or sanctioned, but by a distant corporate entity, rather than by an immediate military one. As such, Arlington – an otherwise deeply curated and regimented space – does not have the authority or ability to affect the augmented layer that has been imposed upon it. In 2016, Arlington asked visitors to refrain from playing Pokémon GO within its grounds: six years later, the PokéStops and gyms that enable such activity remain present and actively engaged with by visitors. Through the lens of Pokémon GO, the augmented landscape of Arlington National Cemetery is a crowd-sourced depiction, very different in origin, but in essence, an archive of its own – a companion, not a true extension, to the physical and virtual landscapes.

Discussion

In the chapter titled "For Us, the Living" in *The Politics of Mourning*, McElya discusses at length how Arlington has made adherence to a uniform narrative of ultimate sacrifice a mandatory prerequisite for who can be accounted among its 'honored dead'. McElya argues that those who exist outside the template of a good soldier – a willing, cisgender male who is heterosexual and largely white – are at best considered tokens and at worst deliberately erased. McElya also highlights the decision made by the United States Department of Defense in 1967, two years into the Vietnam War, to bar most Vietnam veterans from burial at Arlington (2016, p. 247). Anti-war sentiment had swelled to the extent that the narrative of national sacrifice within the cemetery's walls was necessary to protect through deliberate exclusion. Those soldiers who were not career military officers, who had been drafted into the Vietnam War, did not count as "honored" dead, only dead. They were deemed unworthy of the respect that such a site inspires, and were to be buried elsewhere once returned to their families.

The presence and absence of headstones and monuments, as well as their virtual and augmented depictions, all contribute to the telling of a landscape's story. Arlington is full of "ghosts of place"; visible, invisible, and somewhere in-between. It is a landscape all but defined by its reiterated symbolic accretion, one that continually reinforces a uniform narrative of heroic sacrifice. Monuments and "honored dead" alike are curated, sanctioned, and archived for particular purpose and intent. This necessarily entails deliberate acts of inclusion and exclusion in order for this narrative to be sustained and perpetuated.

The narrative that Arlington National Cemetery presents, "the most hallowed burial ground of our Nation's fallen" (ANC, n.d.,), creates a deliberate distance, tangibly and spiritually distinct from not just the surrounding area, but elevated above other comparable sites. But in essence, cemeteries are made from, and depend on, people – both the buried, and the living to instill the presence of the dead with meaning.

Memorializing, not memorializing, or *de*-memorializing the dead is undertaken by individuals and institutions who curate the landscape. As social and cultural norms progress and change, what is considered to be "hallowed" in the past is not necessarily the case in the present. I discuss three iterations of these features, all considered to be "haunted" in some fashion.

An Augmented Haunting: The Confederate National Monument

The Confederate Monument at Arlington National Cemetery is a feature on the virtual, physical, and augmented landscape. Unveiled in 1914, it serves to memorialize those who were buried at Arlington during the Civil War, but also reiterates racist and Lost Cause mythology, beliefs held by the sculptor and the main funders, the United Daughters of the Confederacy. Nevertheless, it remains prominent in the landscape, standing at over 30 feet in height. Historically offensive stereotypes include the "Mammy" and the "Faithful Servant" representation of the enslaved (Murphy 2020, pp. 170-171). Its continual display and what it represents is clearly offensive.

In June 2020, during what was at the time the height of George Floyd protests across the United States, an amendment to the annual defense bill was suggested and accepted by the Senate Armed Services Committee to rename military bases named after or commemorating the Confederate States of America. A Naming Commission was instituted, and as part of their final report, the commission recommended that, in regards to the Confederate Monument, "all bronze elements on the monument should be deconstructed, and removed, preferably leaving the granite base and foundation in place to minimize risk of inadvertent disturbance of graves" (Naming Commission, 2022). These recommendations remain unfulfilled, but interestingly, the area remains largely inaccessible.

To have such a memorial remain in a space that claims to represent and honor the sacrifices of all Americans, but deliberately keep the memorial inaccessible in order to offset criticism from those who would otherwise see the imagery, is the height of the enforced narrative that Arlington National Cemetery wants to preserve and maintain. After all, if the public does not know a feature is present, then no one in the public can demand its removal, and simultaneously, there will be no backlash if a removal does happen in the future. The focus can remain where it should be - on the uniformity and sameness of sacrifice.

When visiting the site in question, it was physically impossible to get closer than about half a mile away from its section. Signage regarding renovations and turf repair abounded, as did orange caution netting. I noted it as such, but in October 2022, a full year after the initial ground-truthing efforts were conducted, I returned once again to see if there were any changes to the landscape or its grounds. If anything, there were more restrictions to accessing the site, and yet it remains featured on the virtual, physical, and augmented representations of space in Arlington National Cemetery. Thus, this haunting is an augmented one - it exists, but only in potentia.

A Visible Haunting: "Lest We Forget"

No feature or monument at Arlington National Cemetery acknowledges or elaborates on the nature of Section 27, as discussed previously. One memorial, however, does pay tribute to Black Americans and the roles they played in relation to Arlington prior to, during, and after the Civil War. In both the physical and the augmented landscape, it is titled: "Lest We Forget - We Stand on Your Shoulders". It is depicted in its augmented representation in Figure 1.9. The plaque is located in Section 27, and placed in 1992 by the Committee to Memorialize African-Americans of the Civil War. Its text reads:

Dedicated in memory of
the United States Coloured Troops.
Citizens, Freed Slaves, and Contraband of Freedman's Village
By Descendants and Friends

The acknowledgement of these soldiers' sacrifice is visible and tangible in the physical landscape in this plaque. That it was placed over 125 years after the fact tells its own story regarding race and racism in the United States.

More information about Black soldiers who served in the Civil War is available on the Arlington official website. Arlington describes them as "composed mainly of African American soldiers (and white officers) who fought in the Civil War and…in the so-called 'Indian Wars' in the American West….Read more about these regiments here" (ANC, n.d.).

The "here" linked above on the original page directs to a PDF of *Freedom by the Sword: the U.S. Colored Troops, 1862–1867* by historian and archivist William Dobak. The book itself is, by and large, a blow-by-blow description of the military action of Black soldiers during that period. The tone and context-setting forward, however, is penned by chief historian of the US Army Center of Military History Richard Stewart. It states:

> *"...other works have dealt with such subjects as the Colored Troops and racial discrimination…Instead, Freedom by the Sword tells what they did as soldiers during the war…these men rallied to the colors in large numbers and fought. It is thus a quintessentially American story"* (Dobak, 2011, p. xi.)

This framing is deliberate. It situates the servicemen in question as having lives of racial discrimination that were separate from their lives of service, as though their experience in wartime can be separated from the emotional and practical entanglements implicit in fighting a war over whether their own enslavement was to be considered permissible. Regardless of whether the statement was well-intentioned, it perpetuates a narrative of uniformity, a resolute depiction of 'sameness in sacrifice' that endeavors to instill the monument itself with a new sense of symbolic accretion - the elevation of the soldier at the expense of intersectionality and candor about societal struggle. More than



Figure 1.9. "Lest We Forget", as represented in Pokémon GO. It is interesting to note that the featured image - in the blue circle - is not of the plaque, but of the site itself.

that, however, is the extent to which the cemetery draws no attention to the USCT narrative to begin with. The memorial cannot be found on the website unless one is deliberately looking for it, and the memorial site itself is not listed as one worthy of exploration in either the virtual website or in physical signage. While it is visible, it is simultaneously invisible, reminiscent of the "absent presence" encountered in places of deep psychological impact, such as the September 11th Memorial Museum (Micieli-Voutsinas, 2017).

The "Lest We Forget" memorial is also notable in that it acknowledges the displaced Freedman's Village explicitly, though it is only briefly mentioned. Freedman's Village is not featured in *any* landscape at Arlington National Cemetery significantly, including the village's former location. An informational plaque is viewable in the physical space at nearby Arlington House, which is administered by the National Park Service. The informational plaque at Arlington House focuses predominantly on where the former grounds were in relation to the current cemetery site, with the displacement and removal of its occupants reduced to a singular event in history rather than as part of a sustained effort to remove newly-freed people from the area. Prior to the community's eviction and destruction, many attempts were made to charge the newly-freed formerly enslaved men and women high rent in order to convince them to find new housing more quickly (Murphy, 2020, p. 149), and the Army had been attempting to close the village as early as the end of the Civil War (ibid., p. 151). The cemetery's website refers to Freedman's Village as "essentially a refugee camp" – a reductive way to characterize such a thriving community – that "had a lasting legacy" on the Arlington website. That so-called legacy is visible if one searches for it, and even then, its depiction and memorialization is sanitized, downplayed, and obscured. If lack of still-standing structures is the rationale for not memorializing the former site of Freedman's Village, this is certainly ironic, in that the removal of those structures and that community is the act for which commemoration and recognition is warranted. If the line of thought runs that the National Park Service has mentioned it already, and therefore, there is no need to reiterate what's been said, it is both dismissive and an act of conscious curation – one that seeks to preserve the Arlington narrative of uniformity.

The "Lest We Forget" PokéStop in the augmented landscape draws more attention to the memorial's existence – and, tangentially, the history of Freedman's Village – than Arlington National Cemetery does in any official physical capacity. It acts as a draw to users to seek the site out in order to access its resources, perhaps in doing so being introduced to the history of Black Americans interred in the cemetery's grounds. It is highlighted in the augmented landscape in a way it is not in the physical, where it is only visible if one knows where and how to look. A ghost of place is seen here only in glimpses, made visible through the augmented lens.

Invisible Haunting: The Ghosts of the 442nd Infantry Regiment

A question arose as the augmented landscape presented ghosts of place to interrogate - what about those that were *not* seen in *any* space? What sort of haunting would they articulate? Could an augmented landscape give them the recognition they so

deserved - and how? I worked to uncover other military units that, like the USCT, were under-recognized, and found instead a totally unrecognized or "invisible" ghost of place.

The 442nd Infantry Regiment was an infantry combat team in the European Theater of World War II, and was composed almost entirely of second-generation Japanese-American volunteers. It is one of the most highly decorated units in the entirety of American military history (Morita, 1992, p. 6). Over twenty Medals of Honor, the highest-ranking combat medal, were issued, and over 4,000 Purple Hearts for injuries sustained in combat were awarded over the course of the war (ibid, p. 7). Primarily operating in Italy, they were also instrumental in liberating concentration death camps, including Dachau (Menton, 1994). Over 20 members of this unit are buried on the grounds of Arlington National Cemetery. They are recognized in part by the "National Japanese American Memorial" on the National Mall established in 2000, along with other Japanese-American units and civilians subject to detention camps at the hands of the United States military (National Park Service, 2022). And yet, for all their contributions to the war, and for all the honors that the 442nd earned, their sacrifice and dedication is nowhere to be found on the grounds of Arlington National Cemetery - only in the regiment being etched on members' headstones.

Invisible in the physical landscape, the virtual landscape offers little more. The only mention of the unit found is by searching deliberately for "442nd" in the search bar on the website; this leads to a page tree listing of Explore/Notable-Graves/Minorities/Japanese- American-Service-Members. This link is not visible or accessible from website navigation and there is no page that is labeled as "minorities" from which a user might be able to find more information. If one is to select for other ethnic and racial minorities mentioned as "notable", no such page tree exists, and consists of /Notable-Graves/Hispanic-Americans, for instance.

If this was the only component to the erasure of this unit, it could be coincidence, but in searching further, the single other mention of the unit and its contributions to the European Theater is a blog post from 2020, written by Jennifer Leigh Van Vleck. This author gives no credentials and is the author of many blog posts for the official Arlington National Cemetery site, but she is not listed anywhere as a contributor, and selecting her user profile at the bottom of a post redirects to a broken URL. It is disappointing to see such little effort on the part of a national site dedicated to honor and remembrance to do so little on the digital front. Searching for Van Vleck in academic circles turns up a dissertation from 2009, but no references as to who she is within the framework of Arlington National Cemetery or under whose instruction these posts are made. Her most recent post is from September of 2022 discussing the use of firearm salutes at the grounds, but again, there is no contact information, credentials, or references listed throughout the posted blog entry. It is a version of acknowledgement - but it is not from the cemetery itself.

Visiting the individual graves of the 442nd buried at Arlington is possible, but they are distributed throughout the grounds of Section 12, a section in which most service members were killed in action overseas and buried once remains were repatriated to the

United States. No central point is truly available in which to center a memorial or monument within Section 12, but that is not enough of a reason to not honor the unit. I saw no mention online of any campaign or movement for them to receive recognition, but this may be due, again, to anti-Japanese sentiment that persisted until the formation of the "model minority" myth in American culture, first becoming mainstream in the 1960's. The 442nd, in its time, was surprisingly treated as a "model minority" example (Kurashige, 2011, p. 66), and it is interesting that the cemetery has not included them within their "notable graves" category online, let alone referencing them within the physical landscape of the grounds.

To a certain extent, there is a parallel to draw here. Neither the USCT nor the 442nd are acknowledged explicitly in the framework of the physical space of Arlington National Cemetery, and their presence in the virtual representation of the site is minor at best. However, the USCT has a marker - the 442nd does not - and thus, while neither is truly visible to the majority of an audience, the possibility of recognition remains for the USCT in a way that is not accessible for the 44nd. I distinguish these as visible and invisible ghosts for that specific purpose. While the augmented space allows the USCT to be seen, even if it is only by some, there is no way for the same sense of recognition and power to be allocated to the 442nd, unless a monument or memorial is established in the future. The unit remains, for all intents and purposes, an invisible, ghostly unit of place.

Conclusions: Space, place, and purpose

Within the realm of Arlington National Cemetery, the physical and virtual landscape(s) have been constructed to communicate an overarching, unified narrative in line with its function as a national military cemetery – one of collective, faceless sacrifice. In the augmented landscape, as experienced through GO, this unified narrative is not necessarily as present, with curation of the sites and the landscape as a whole extended. Without the enforcement of the dominant narrative, the features within the augmented landscape serve a new and different purpose. Investigation provides context regarding which individual memorials and markers are marked in this liminal space, providing an additional layer of curation that is separate from the physical space. Because this form of placemaking is conducted by users of GO and no one else, it exists outside the narrative-setting control of those who maintain the cemetery. Consequently, for those who experience the cemetery through the lens of GO, Arlington's landscape is supplemented and diversified implicitly, allowing those users to recognize, honor, and engage with the dead as individuals, rather than as an amalgamated collective.

Curation of spaces, particularly those of national significance, can often be a function of the state -- or by entities whose reinforcement of societal norms, standards, and laws makes them 'state-like'. As Arlington is a national military cemetery, the degree and impact of its curation is amplified. The cemetery's curators endeavor to craft a deliberate experience for those who visit its grounds – one that uses symbolic accretion and enforcement of a national narrative to convey uniform, collective sacrifice. Majority narratives are difficult to interrogate. Augmented reality provides more range with which

to include, emphasize, or refute liminal landscapes, allowing for seemingly-mundane gaming applications to become vehicles of transgressive transformation. A graveyard is no longer a graveyard in an augmented perspective - rather, it is a place for socialization and play. Most remain invisible to cemetery visitors, but they play a vibrant part in a small subset of peoples' lives. They are ghosts in the cemetery, despite their existence.

Transgressive space has a home and a reach beyond the virtual or physical landscapes, both of which are subject to a far more uniform narrative and structure. It is limited, as users must know such features exist by being part of the augmented landscape in the first place, but it provides a possibility to see the diversity in the presented landscape of sameness. Using Agnew's conceptions of place once again for a moment, Arlington is most relevant in the third area - in its sense of place to those who visit - and Dwyer's contribution regarding symbolic accretion is absolutely present in how the physical structures are represented. Dwyer's *antithetical* symbolic accretion contributes new meanings and purposes to features that would otherwise be ignored, visible for those in conversation with the augmented landscape.

Creating transgressive space – when a landscape does not align with how it "should" be, whether in its physical, virtual, or augmented representation – is made easier with augmented reality. By creating the site as a place of interaction, a non-monolithic narrative to this site of very deliberate curation is possible to see. Symbolic accretion and ghosts of place can help us understand different landscapes, but questions remain about moral imperatives, from the Confederate Monument remaining inaccessible but unaltered, to the ethics of playing a game *requiring combat to progress* in a military cemetery.

The dominant narrative of national(ist) sacrifice and honor remains present throughout the virtual and physical landscapes, and to a certain extent, in the augmented landscape also. However, this narrative is disrupted at times by the augmented landscape presenting alternate sites for recognition and eventual commemoration. While there is little to suggest that there is a deliberate suppression of knowledge, a passive suppression due to lack of engagement is absolutely possible. Those recognized are those that fit within the narrative, and thus are *easy* to promote in order for a message of sameness to be conveyed. In contrast, those that do not fit are disallowed, either explicitly or more subtly.

The landscape of Arlington National Cemetery requires multiple lenses to view fully; for those that wish to understand those within and their sacrifice, as well as critically consider those commemorated, the augmented landscape is vital. As social and cultural norms continue to change, what is seen and highlighted will continue to shift also; it remains to see if Arlington will, or can, do this, while maintaining their particular standards and narratives of place.

CHAPTER/ARTICLE II
STATIC SITES, DYNAMIC SPACES: SPACE-TIME FLATTENING OF PLACE THROUGH POKÉMON GO

Westenhoff, L., and Soblo, H. (2022). Static Sites, Dynamic Spaces: Space-time flattening of place through Pokémon GO. *Material Culture, 54* (2), 41-58.

The original version of this chapter was an article co-written by myself and Hannah Soblo, a recent doctoral graduate in rhetoric/composition, in an effort to explore the augmented reality landscape from the perspective of linguistic landscaping in parallel with critical landscape studies. The original article was published in *Material Culture* in the fall of 2022.

Abstract

Place-names and descriptive memorials are inherently subject to interpretation by the viewer. However, there can be a significant loss of context in the representation of dynamic sites, and therefore, a reduction of their meaning. This is especially pronounced in the use of augmented reality (AR) technology, and particularly through recent popular AR games like Pokémon GO, as features of interest are presented as static objects in space and time. This article focuses on two sites in Knoxville, TN, which are represented in a range of ways in the real world, but are restricted to single images in a gamified context. By engaging with these sites through multiple media, we found the limited representations of the sites not only inaccurate, but potentially dangerous for players of social minorities. We additionally investigate the impact of gaming in altering players' experiences of these complex sites, as well as how the corporate mediation of sites can further affect representations of space. The resulting simplification of representations, through which the context of sites becomes constrained and artificial for the purposes of recreational use, we term space-time devaluation. We find that digital representations of space in an AR framework do not (re)present the complex narrative that exists in the physical landscape, but instead present a flattened and sanitized narrative of place, resulting in significant losses in the cultural and representational context of these sites.

Introduction

Over the past thirty years, cultural geography and sociolinguistics have undergone comparable developments in the ways in which they critique the governance and manipulation of landscape through, most significantly, linguistic and/or visual representation. Both fields have moved from taking landscapes "as they are" into investigations of why they are – and why they are not. The politics of space is where these investigations are most often conducted, and most explicitly through a lens of critical toponymy. In sociolinguistics, this is typically known as linguistic landscapes (LL). The difference is in the subject of study – "heterogeneity in space" or "heterogeneity in society" (Britain, 2013). The subjects are divergent, but fundamentally interconnected: society, and culture, exists within space. Seeking out the patterns and processes that shape both landscapes and people groups can reveal new information and findings through parallel, collaborative work. Collaboration and cross-pollination between these fields is therefore valuable in advancing our collective understanding of place and representation.

While AR relies on both a physical and digital layer for its landscape to function, those digital representations of space within AR landscapes are inherently unable to capture the complete context in which dynamic sites exist. AR landscapes do not (re)present the complex narrative that exists in the physical landscape. Rather, they present a flattened and sanitized narrative of place. We refer to this phenomenon as this space-time flattening, an extension of the concept of "space-time compression" as articulated by human geographer Doreen Massey (1994). Massey's work on space-time compression is in reference to the documentation of global trends of cultural and societal reduction as a result of increased access to and use of technology. As significant advancements have been made in spatial representation since the original term was coined, particularly with respect to the layering AR requires, "space-time flattening" builds upon and updates Massey's (1994) term to reflect how new and emergent technologies affect the ways in which landscapes are experienced.

A further extension of this concept that we explore in this chapter is "space-time devaluation". The application of digital layers of AR can reify, alter, or erase what would otherwise be physical representations of place. This includes the monumentalization – or lack thereof – of certain places, people, or points in time. These technologies do not exist in a vacuum; they are the product of corporations, whose mediation and representation of physical space can result in sanitized versions of layered places at the expense of context and meaning. In this way, space-time devaluation contributes to landscape research by demonstrating how augmenting physical landscapes can add, detract, and reimagine them in ways that affect their value - largely for the lesser - in terms of complexity, content, and potential engagement with grassroots narratives.

This paper presents two sites in Knoxville, TN, as case studies in describing differing representations of space and place through the methodological lens of AR layering. We describe the complexities of representations of these sites by not only the artists, student organizations, or content contributors themselves who represent the spaces

through physical and digital means, but also by those who view these representations. We also analyze the potential issues with the way AR is governed, organized, and enforced in the digital landscape and how the physical is subsequently impacted. To do so, we employ Graham, Zook and Boulton's (2013) concept of "distributed power" as a framework to engage with the digital landscape. Distributed power in AR contexts arises because most mobile AR applications (apps) rely on a small percentage of users to provide content. This impacts the AR landscape to reify inaccurate, biased, or otherwise narrow conceptions of place. Sites of inaccurate spatial representation, particularly involving sites of complex history, are examples of space-time flattening, and further, space-time devaluation. We illustrate these terms through the AR game Pokémon GO, which serves as a play-based methodological lens. This mobile application (app) has from its beginning been used by players to alter or augment representations of space, and its company, Niantic Inc., curates the experience of the user by mediating representations that appear in-game. The end result of this curation is space-time devaluation.

Sites: Artist Alley and The Rock

Site 1: Artist Alley, Knoxville, TN

A half block east of downtown Knoxville's Market Square, a narrow alley runs between the buildings that face west towards the Square and the buildings that face east along Gay Street. Technically Strong Street in address, but more commonly known as "Artist Alley," local artists have contributed the many murals lining the alley. Artist Alley is a space with complex and multilayered representations, including sanctioned and unsanctioned art, which is left unaccounted for and obscured within the AR representation in Pokémon GO. The site that represents this alley in the AR map is called the "Millers Building Artist Alley Mural." A black and white line-art-style mural of a cathedral or other religious building, it seems at minor odds to the riot of color more prevalent in the area. Perhaps this is why it only exists in the augmented landscape of the alley, and has been painted over by a new mural in the physical space – that of Dolly Parton. The original Dolly Parton mural was completed in 2019, three years after the launch of Pokémon GO.

Since the Dolly Parton mural was originally painted, it has been repainted after being defaced with black paint, giving the figure what the artist called "gothic lips" (Wilusz, 2020). The mural was restored soon after, and in addition to the restoration of her lip color, the refurbished mural added butterflies and a more contemporary hairstyle. Despite these multiple changes to the physical site, the AR representation has remained static in representing the Miller's Building mural. The juxtaposition between the current mural and the AR representation is shown in Figure 2.1.

Site 2: The Rock, University of Tennessee-Knoxville, Knoxville, TN

The Rock is a site on the University of Tennessee-Knoxville (UTK) campus that frequently serves as a forum for political opinion and activism. A multi-ton stone located

in the southwestern area of the main campus, students frequently spray-paint and otherwise decorate the face with messages ranging from football scores to marriage proposals. As there is no administration as to who paints The Rock when, its face changes frequently, sometimes multiple times in a day. It has been a site for conflict and white supremacist dialogue in the recent past as well, addressed by the university administration in varying degrees of effectiveness.

The face of The Rock within the context of Pokémon GO is much less dynamic. It displays a solid orange face, with the accompanying text "graffiti legal…graffiti encouraged …University of Tennessee 1794," shown in Figure 2.2. The Rock in the accompanying image has the familiar gameday message of "wear orange" in white text painted on the face. Alternate images chosen to represent The Rock were not implemented until fall of 2021, and regardless, the initial image presented to a Pokémon GO user is the default orange face.

Frame and Lens

Context and Functions of Pokémon GO

Corporate mediation is a significant, yet under-researched, feature of the landscapes of AR. Representations of places within the AR overlay, such as images, text, and sounds, are created by a small number of users who upload content with potential biases and misleading information, which is further filtered through the governing body (Graham et al., 2013, p. 469). Through filtration, these corporations deliberately engage in space-time flattening and space-time devaluation in order to construct a landscape that is used for recreation, without including the problematic or complex histories of represented sites. This potential limitation or "editing" of spatial representation in recreational apps by corporations is a form of distributed power. In our context, distributed power occurs through the mediation of Niantic in their popular AR game Pokémon GO.

Pokémon GO is a game played on mobile devices such as smartphones, which is predicated on the collection of digital creatures called Pokémon. Users must visit and interact with certain locations marked on the in-game map–a digitized version of their real-world location–in order to gain the items needed to collect Pokémon. These locations, referred to in-game as PokéStops or Gyms, correspond to real-life features on the landscape such as statues, signage, historic markers, and places of worship.

Figure 2.3 shows these locations on the in-game map, demarcated by the blue floating cubes and tall orb-shaped towers. Since players need to visit physical locations in order to collect Pokémon, this creates an impetus to explore real-world areas with which players are unfamiliar, and subsequently, to build networking and overlapping connections of place within areas, a concept known as "situation" in human geography. The longevity and popularity of Pokémon GO in comparison to other mobile AR-based games has provided a useful tool for researchers interested in the mobile gaming community and play as well as the landscapes of AR (Carrera et al., 2018; Tekinbas, 2017).



Figure 2.1. Side-by-side representation of what is physically present in Artist Alley – Dolly Parton's mural – and what is shown in the augmented layer as the Millers Building Mural, despite the Dolly mural being extant for at least four years.

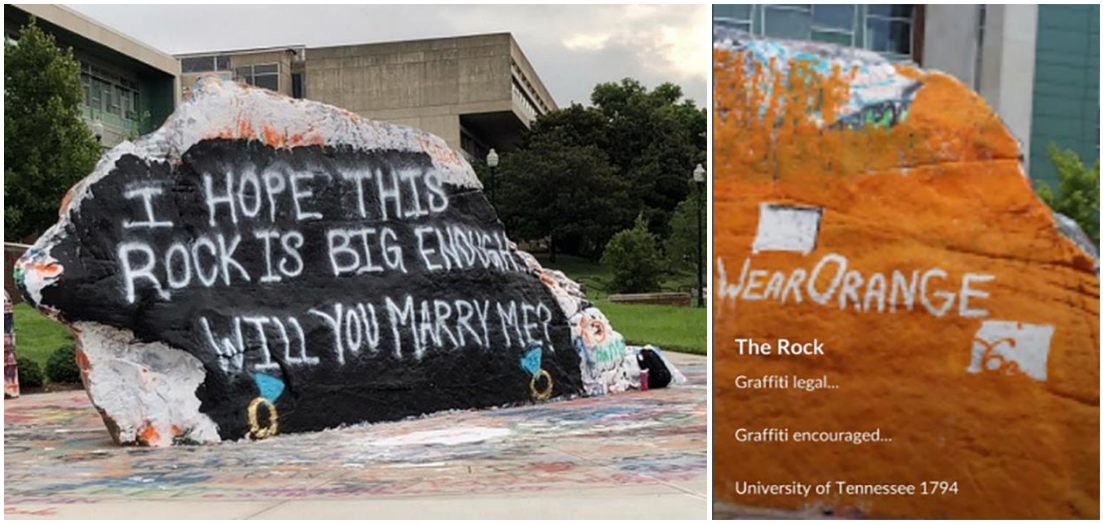


Figure 2.2. Side-by-side representation of an example of the Rock's dynamic, changing face – in this case, referencing a marriage proposal – and its representation in the augmented layer as, simply, "wear orange".



Figure 2.3. The in-game Pokémon GO map; blue diamonds and spherical structures mark real-life features of interest with which to interact.

The digital map created by Pokémon GO exists as a form of archive, documenting real spaces in the physical world, and since it is an archive, it is important to question how the archive is formed and who contributes to it. Niantic crowdsources nominations for in-game sites from its playerbase through their web platform Wayfarer. While users can nominate sites anywhere, the Wayfarer review process is geolocated, enabling users to rate features only within a specific geographic range. Site nominations include images and brief descriptions of potential sites which are then rated by other users according to Niantic's criteria. According to Niantic, site submissions should be:

> *"A location with a cool story, a place in history or educational value; An interesting piece of art or unique architecture (Statues, paintings, mosaics, light installations, etc.); A hidden gem or hyper-local spot; Public parks; Public libraries; Public places of worship; Major transit stations hubs (like Grand Central Station)"* (Niantic Inc., n.d.)

While overtly crowdsourced, Niantic covertly controls the sites of representation through their criteria, as well as by limiting site submissions to players who have made certain in-game achievements and limiting the amount of sites that can appear in-game via "cells"– the developers' internal division of the geographic landscape that is not visible to players. In other words, if a user suggests a site in a cell where sites already exist in-game, their submission will be rejected no matter its user rating.

The two case study locations described in this paper are represented in Pokémon GO as "gyms" - sites that players frequently interact with in order to obtain in-game resources. In the digital landscape, these gyms appear as towers that are the color of the occupying team, as seen in Figure 2.3 to the right of the avatar. Gym spaces as sites of competition in-game bring high rates of player engagement to the places they represent. Many players a day will see and interact with the site as it is presented in-game, regardless of its accuracy in representing the physical equivalent.

Frame: Linguistic Landscaping and Critical Toponymy

In its function as an archive of location-based representation, Pokémon GO serves as a valuable resource to researchers of play in the context of language and space. In this section we draw on our multidisciplinary backgrounds to situate the study of language and place through AR in the context of sociolinguistics and human geography, specifically in the two related subfields of linguistic landscapes (LL) and critical toponymy.

Critical toponymy examines the representations of landscape through text, imagery, and symbolism, such as license plate slogans acting as purveyors of banal nationalism (Leib, 2011), the invasive plant kudzu shifting from a pest to a part of Southern identity (Alderman, 2015), and how erasure of graffiti from landscapes erases the voices of the under-represented and perpetuates a normative perspective on what a place "should" be (Moreau and Alderman, 2011). Further, critical toponymy focuses not exclusively on the site or feature in question, but situational pieces of the built landscape

that establish and inform a dynamic sense of place, especially through similar and dissimilar conceptions of the same geographic feature in light of these situational components (Light, 2014; Post and Alderman, 2014). Some researchers take this further and interrogate the transgressive claiming elements associated with places of contestation (Brasher et al., 2017; Moreau and Alderman, 2011). The key focus of place in the interrogation of the landscape is what centers this work within geography.

The study of linguistic landscapes (LLs) in sociolinguistics has similarly examined the relationship between language and place, beginning with the seminal article by Landry and Bourhis (1997). LL research has expanded to address the rapid growth in means of communication, semiotic representations, digitized landscapes, and research in sociolinguistics that directly addressed place-based variation and language attitudes (Johnstone, 2009; Preston, 2013; Puzey, 2016). In the last decade, LL research has also given increased attention to emplaced language as a social fact or phenomena, understanding the presence of language within a given place as reflecting prevailing social structures. In this tradition, the LL is an active construction of representations – sometimes called linguistic landscaping – and researchers must acknowledge the influence of social, cultural, and historic ideologies related to linguistic and symbolic representation (Jaworski and Thurlow, 2010).

In both of these disciplinary traditions, AR technology has created opportunities to examine places of play, which can often be considered a transgressive use of space. Places are constructed, used, and understood by and through digital maps, and play is one opportunity of many for engagement with the digital-physical dichotomy. Mapping technology, business rating systems, and tourist guides underlie much of what humans do in places (Mark et al., 2011). This is particularly true for mobile AR games such as Pokémon GO as they add to the perceived value of place by overlaying the physical context with gamified content. The transformation of places is not unique or new in AR gaming, but rather continues a tradition of the transformation of urban spaces through transgressive play (de Souza e Silva and Hjorth, 2009; de Souza e Silva and Sutko, 2008). Researchers have proposed that gameplay is a transgressive use of space when a space is not intended for play, and gameplay elements can, in themselves, become mediums for alternative representations of space.

Research on AR has already demonstrated how gameplay features can be used transgressively, notably to advocate for underrepresented groups. Shortly after the release of Pokémon GO, for instance, multiple news outlets picked up a story about players using the AR site that represented the Westboro Baptist Church to combat the church's historically outspoken anti-LGBTQ+ rhetoric by leaving a Clefairy (a type of Pokémon) nicknamed "Loveislove" at the gym, a reference to the "love is love" movement in same-sex marriage advocacy. Players in this area coordinated to keep "Loveislove" the Clefairy at the site for as long as possible and their campaign was widely distributed via social media and news outlets. By crossing the barrier from in-group to out-group knowledge, AR possesses remarkable potential to transform representations of sites. This example

demonstrates the altered perceptions and uses of space that occur when people engage not solely with the physical site, but additionally with the overlay of digitized representation.

Although some research on AR gaming spaces has focused on the potential of digital spaces for transgressive use, other work in the last decade has shifted to highlight how digitized content can perpetuate heteronormative use and representation of place. In mediating the uses of place, AR technology constructs implicit values and meanings for particular places, as well as perpetuating the social and cultural stigmas of physical places. For instance, Tekinbas (2017) uses online message boards and personal experience to illustrate how playing Pokémon GO as a Black person in the United States carries an added threat when venturing into new spaces, including advice of online columns to "dress cute," "walk a dog," or "bring a non-black friend" to present an intentionally harmless image (p. 36). Despite these examples, gaming platforms and their place-based content are still implied to be apolitical, since an interrogation of the platform or app itself is not typically the object of focus (Hunt and Stevenson, 2017; Young, 2020). Hunt and Stevenson (2017), in particular, warn that such "techno-utopian accounts about the liberatory potential of the digital remain prevalent" and emphasize that digitized content needs to be critically examined as rigorously as physical representations of people and space (p. 384). The actions of gaming corporations and the ramifications of these actions on user play are not neutral, but implicitly political.

Methods

Collection and analysis

In this paper, we describe differences in digital and physical representations of Artist Alley and The Rock, both frequently-updated art installations, in Knoxville, TN. These sites were selected due to their explicitly ephemeral nature as new murals and activist art are encouraged at each site. Due to this, they are more difficult to keep up to date in-game, and provide the widest opportunity in which to explore the change from the initial "archive entry."

Data was collected in two phases: we first photographed sites in Fall 2019, then documented ongoing changes to sites regularly in the year 2020. In the first phase of data collection, we walked the sites to assess three factors: 1) whether a site was present in both AR and physically, 2) if it was, how representations were similar or different between AR and physical, and 3) if there were differences, how the representation in AR altered the narrative of the physical space. Following this, in 2020, we reexamined the same sites in order to document the changes they had experienced. Noting physical changes over time, particularly in the case of The Rock, gave us opportunities to engage in analysis of the images chosen, and not chosen, as digital representations of the sites in question.

Our analysis stems from images and screen captures of in-game and physical representations of each site. The focus of data analysis is the flattening effect of AR

representation at each site. The imagery chosen for site representation can functionally perform three things. The imagery can simply not exist at all, which we classify as erasure; the imagery can be limited or sanitized, which we describe as conciliation; and finally, the representation can engage with conflicting representations dynamically, creating a true situation of place. We analyzed images from Pokémon GO and from our own and media images of Artist Alley and The Rock in order to document how the differing representations of AR either erased, conciliated, or constructed a dynamic situation respective to the physical site. This theoretical framework is graphically represented in Figure 2.4.

In the framework of a game that is explicitly based on the landscape of the physical world, users of Pokémon GO experience not only what is physically present in the landscape, but also the site(s) represented as part of the landscape in the AR map. However, we find that AR representations often erase the history and complexity of physical spaces, a process we describe as space-time devaluation. In this section, we provide details on the divergent AR and physical representations of our two case sites in Knoxville, TN, and discuss the implications of flattened AR representations of dynamic physical sites.

Discussion

Artist Alley: Conciliation and Erasure

In representing the Miller's Building, Pokémon GO obscures not only what currently occupies the physical space, but also the many other murals, artist tags, and other art that line the inner part of the alley.

The fact that the "Miller's Building" was chosen as the only mural in the entirety of Artist Alley for representation in AR reflects the oversimplification of space and context in the AR platform. The Miller's Building, although once a real building in the area, is not iconic of Tennessee or Knoxville in the same way that Dolly Parton is. The AR site, therefore, represents a flattening of the space to be more universal and less located in the iconicity of Tennessee. The difference in representations between AR and physical landscapes is an example of both conciliation, as the AR site presents none of the conflict that occurred in the physical space, and erasure, as the updated mural is absent in AR.

In Artist Alley, a stilling effect is created regarding authenticity of the space. As the alley is represented by an image that no longer exists in the physical space, the image is not truly representative at all. This presents an interesting dichotomy of directions in which the alley presents itself – either as an "authorized" art space with occasionally intrusive graffiti art that disrupts the "official" art, or as a space in which art is not permitted, much as the "graffiti hurts" movement views all street art as graffiti regardless of intent (Moreau and Alderman, 2011). While the graffiti tagging itself serves a different purpose than the authorized murals of the alley, its purpose in resisting the status quo

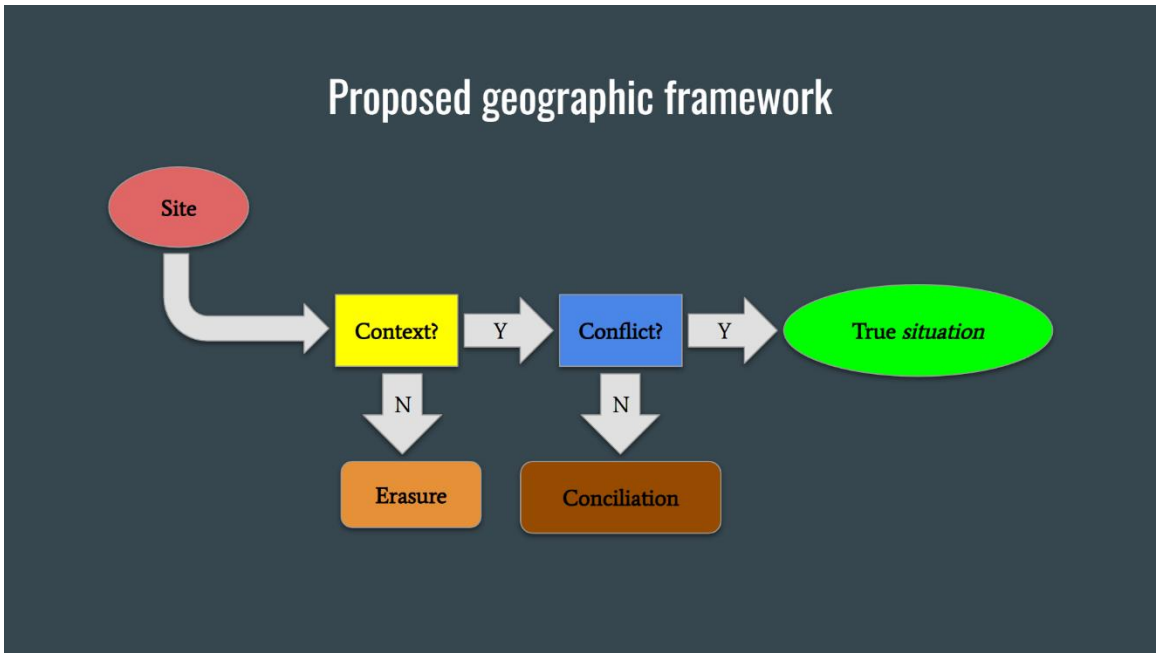


Figure 2.4. Proposed geographic framework for considering the site-situation structure in the context of Augmented Reality.

perhaps serves better as an example of transgressive use of space than its authorized counterparts. The graffiti tags over the murals further enforce the authorized-while-unauthorized divide, which goes unacknowledged in the AR representation of the space. Within the AR framework, this creates an artificially flattened view that focuses on a single authorized mural, while the art pieces–both authorized and not–physically present remain dynamic and complex.

The Rock: Space-Time Devaluation at Work

While the Rock has been a venue for positive and negative events and expressions of opinion, white supremacist graffiti was painted on the rock surface, including swastikas in 2018, crossing the line from expression to explicit hate. In their response, the university focused on the right to free speech as described in the First Amendment, which did not address concerns of students who felt unsafe in the university space. Instead, students painted "Nazi Punks F*ck Off" (uncensored in the original) on the face of The Rock, displacing the white power messages and reclaiming the space.

The student response in 2018 contrasted sharply to an earlier campaign from the university, known as "Vol Means All," in addressing a prior white supremacist graffiti event. Participants were encouraged to put handprints on the face of The Rock in multiple colors in an effort to highlight diversity as well as similarity within the student body. The students' 2018 response "Nazi Punks," while aggressive in its messaging, was far more effective in communicating an anti-racist and anti-Nazi agenda, and represents a transgressive - yet clear in intention - occupation of the space. Any person can use chalk or paint on the feature, but anyone can replace a previous message within a short frame of time. This was effective in the case mentioned above in 2018, as "Nazi Punks" went up within 24 hours of the original white supremacist display.

In contrast to its dynamic and potentially transgressive nature in the physical realm, The Rock is not a dynamic site in Pokémon GO. It displays a solid orange face, with the accompanying text "graffiti legal…graffiti encouraged …University of Tennessee 1794," as shown in Figure 2.2. The rock face in the image has the familiar gameday message of "wear orange" in white text painted on the face. Of all images chosen to represent The Rock, this one in particular is a sanitized, "appropriate" portrayal. Compared to the imagery discussed previously regarding political activism from the student body, it is not surprising that there is no representation of the complexities of The Rock, or even explanation that the site is a constantly-changing one via descriptive text in-game. This choice, to represent the university via a normative landscape (as suggested by Brasher et al., 2017), is typically one associated with a particular image or conception that the organizing entity, in this case Niantic, wants to present to the world. On a piece of public art like The Rock that changes frequently, there is a "stilling" effect seen in the AR representation. As the art in the physical world changes dramatically and dynamically, the site in-game does not. In effect, there is a flattening of space and time via the chosen in-game representation of the site.

While the spatial flattening is not as explicit, the element of mobility and dynamism represented is certainly reduced and flattened just as much as the temporal nature of the still image. In The Rock's AR portrayal, the conflict has been removed from the space represented in the virtual realm. The imagery is present in the space, but the dynamic nature of the site has been reduced to "wear orange"–a conciliation that leaves unacknowledged the recent conflicts and violent messages of the site. The conflicting possibilities present in the dynamic physical site are reduced to a single statement regarding team colors in its AR parallel.

Sites in Concert: Observations and Conclusions

The flattening of space and time in Artist Alley and The Rock illustrates a broader phenomenon in which representative images in recreational AR apps are not evaluated or considered critically. Often, if the site that is represented no longer exists, its virtual representation still holds an image of that particular site. Therefore, we argue that while there is a space-flattening element in the augmented landscape–no topographic information, for example–there is also a *time*-flattening element, in that sites are commemorated solely at one point in time. This flattening of both space and time illustrates that the augmented landscape, while dynamic for the major functions of AR gaming, has very little dynamism when it comes to its chosen sites of commemoration and representation. In sites of change, such as art galleries and public parks, features that were previously present but that have been sold or moved to other areas are still marked in-game as sites for interaction. This dual reduction of sites and context on the in-game map creates many potential issues.

The impacts to both temporal and spatial understandings of the two examined sites, and how different representations might encourage users to interact differently with the landscape, leads us to a further extension of space-time flattening–space-time devaluation. While space-time flattening illustrates the limits of space first seen in Massey's (1994) space-time compression, space-time devaluation illustrates space and time as constrained and artificial for the purpose of recreational use. Representations of space in the AR landscape of Pokémon GO, an application explicitly used for recreation and play, must be palatable to a broad audience. Physical space cannot be curated in the same ways a virtual equivalent can–therefore, the nuances of in-person representation can be lost or severely limited when the in-game markers do not provide the social context for commemoration. The onus, therefore, is placed on the player to further investigate the social, cultural and political context of what is commemorated in the landscape, and/or on the creator of the initial site representation to articulate that context.

Our research on the representations of space on UTK campus and in the city of Knoxville presents a new direction in the study of transgressive use(s) of space. The flattened representations of The Rock and Artist Alley by the image and text of in-game sites do not represent potentially transgressive uses, but rather present and perpetuate a sanitized narrative. At Artist Alley, the flattening effect is relatively benign, with a now-nonexistent mural represented in place of the Dolly Parton mural. At worst, this might be

discourteous to the artists responsible for the Dolly mural, as well as dissociating the site from the iconicity of Tennessee, but it has little negative social impact for players. Due to this lack of negative impact, we see evidence for space-time devaluation in that the representation of Artist Alley is being constrained. However, the social context lost by Dolly Parton not being the featured mural is not dangerous to players in the same way that it could be at The Rock. At that site, space-time devaluation obscures the violent messages and history for minority students on campus, as well as hiding actual transgressive representations by activist student groups who paint The Rock with messages that counter those left by hate groups. At this site, the AR representation features an image of The Rock painted orange and white, UTK's colors, with the encouragement to "wear orange." Instead of acknowledging the complex and contested representations of the space, the in-game features of Pokémon GO obscure this social struggle by perpetuating a toothless narrative of the public university campus: one connected to the university's sports teams and a typical game-day message to wear the team colors.

While Pokémon GO and other AR games can often be mediums for transgressive representations and uses of space through play, these two examples from UTK campus and the city of Knoxville should caution researchers to not assume that digital renderings of space are always counter to, or even complications of, traditional or hierarchical representations. In these case studies, the AR representations not only perpetuate particular, sanitized narratives of place, but also obscure transgressive representations of the space in the physical world. We recommend that future researchers build on this study by considering the representations of the local landscapes in which they live and work, as well as the social, economic, and political contexts that go unacknowledged in different representations of these landscapes. We also encourage researchers to pursue transdisciplinary approaches to research the augmented landscapes of play, as recreational AR technology becomes increasingly ubiquitous.

CHAPTER/ARTICLE THREE

PEDAGOGY VIA POKÉMON GO: IMPACTS OF COVID-19 ON WALKABILITY AND ENGAGEMENT WITH THE CAMPUS LANDSCAPE AS SEEN THROUGH STUDENT-GENERATED GIS

Abstract

Student movement and engagement in the university landscape is an area of research that has been documented many times; however, there has not been a similar range of research with student engagement in an opt-in, augmented reality aspect to landscape. I worked in this study to understand student movement, walkability, and the addition of an augmented set of information to what is familiar to students, at the University of Tennessee-Knoxville (UTK). In the process of this work, the global pandemic created a set of conditions in which it was unsafe for students to explore outside in the same ways that had been the case in previous semesters. I use Bissell's work on post-COVID landscapes as a framework for understanding how student movement patterns changed between the pre-COVID and post-COVID landscapes of the college campus.

Using data gathered from several semesters of in-person and online lecture, I used anonymized projects as the basis for aggregate digitizations of student movement. Kernel density probabilities and Average Nearest Neighbor statistics confirmed what I had suspected, but not been able to demonstrate prior to these results – that students, due to the pandemic, were experiencing a loss of a sense of place within the university structure. While I cannot definitively state that these results are tied exclusively to a pre- and post-COVID change, I argue the results demonstrate statistical significance, and therefore, serve as a pilot for further studies involving senses of place and the distortion thereof in university students following such a major life and social change.

Introduction

Pokémon GO is an augmented reality mobile gaming application in which users in the physical world interact with virtual representations of their landscapes in-app. Initially released in 2016, GO continues to have a robust community as of the present. Approximately 80 million active users were estimated for the app in 2022 (Shinkle, 2022), with monthly in-game events and in-person gatherings hosted all over the world. The central mechanic of the game is that a user-designed avatar walks in-game along a map modeled on real-world surroundings. As the user walks in the physical world, their avatar attempts to capture, train, and battle virtual "pocket monsters" called Pokémon. While building outlines are included in the map in-game, there are no names or labels to indicate streets, parks, or other physical locations are present. However, there are multiple tools by which users can navigate and understand their landscapes, including by using in-game features of interest, known as "PokéStops", to do so. However, the incorporation of augmented reality technology into geography classrooms and courses remains, in my experience, rare.

There are a variety of reasons for reluctance to incorporate augmented reality projects, including the potentially faddish nature of mobile gaming, coupled with a potential risk of frivolity associated with including such material in a college-level course. On the first front, Pokémon GO has retained enough active users to maintain its relevance and outpaced various sibling competitors such as the Harry Potter-themed "Wizards Unite." Additionally, Pokémon GO has been incorporated into classrooms in other disciplines, including in ecology for modeling wildlife ecology strategies (Lupton, 2017) and in education for the purpose of improving student literacy (Howell, 2017). For geographers, an augmented layer to the existing landscape creates opportunities for dialogue on the fundamental nature of the discipline - on what space and place *mean,* on how a single location can hold a multitude of conflicting emotional entanglements. Frivolity is the furthest thing from these deep, philosophical roots and academic fundamentals. Pokémon GO can serve in the classroom - and should.

Over the course of my semesters lecturing introductory geography courses, I incorporated Pokémon GO into three different semesters at the University of Tennessee-Knoxville. Students were asked to explore their own surroundings and document what they found in their immediate campus landscapes, as well as what they considered campus-adjacent. Students produced tables of "PokéStops" that were within their particular range, along with a small essay, to satisfy the project requirements. After the students had finished the course, these projects were anonymized, and the data within each project was extracted and compiled into a single map for each semester in which students participated. Kernel density spatial analysis was then applied to determine where campus "hotspots" trended; interestingly, there are several differences between student data prior to COVID-19 and the semesters *after* lockdown. These findings, lastly, are discussed via the framework offered by David Bissell to understand post-COVID senses of place and what may be the cause of these particular differences and trends.

While the data collected in this study is site-specific, the approach and conceptual framework are applicable anywhere. The impacts due to COVID, in particular, on sense of place are largely under-discussed. Further, the statistical method employed is transferable at a relatively wide range of scale, keeping certain assumptions to be true in the dataframe. These results suggest some opportunity for future student engagement, especially with augmented reality serving as a guide to new, unfamiliar surroundings.

Site

The University of Tennessee-Knoxville (UTK) is the flagship university within the University of Tennessee system; over 30,000 students, from all 50 states and over 100 countries, attend its 910-acre campus (Office of Institutional Research and Assessment, 2022). The majority of its campus buildings are located directly west of the Knoxville downtown area, separated by Neyland Street, and north of the Tennessee River. Older buildings, some on historical registers, are located at the "Hill", a topographically elevated point, with newer residence halls and facilities stretching westward. The University of Tennessee Institute of Agriculture is affiliated with the UTK campus to some extent, but it exists somewhat autonomously in comparison to the main campus facilities. Veterinary Medicine is also located here; these buildings are separated from the main campus area by Volunteer Boulevard. To the immediate south is the Tennessee River, paralleled by Neyland Avenue.

While there are clear geographic boundaries for the majority of the directions in which the UTK campus lies, the area to the north and west of campus is less restricted to some extent. Cumberland Avenue is the unofficial line between "campus" and "non-campus" facilities, with exceptions on either side of this street. The non-campus area, known colloquially as The Strip, features restaurants, businesses, and some off-campus housing. The majority of off-campus housing that remains walkable, however, is further north, bounded by railroad tracks to the north in parallel to Grand Avenue. To the west and north are two medical facilities - Fort Sanders Regional Medical Center and Children's Hospital East Tennessee - and the remaining non-housing infrastructure largely consists of churches and other religious spaces. Even if students do not live in this neighborhood, many commute to this area over the campus itself due to parking pass expense and lack of a guarantee in finding a campus parking spot (Loukas, 2022). Figure 3.1 provides a hand-drawn map of the campus area and adjacent features.

Theory: Pokémon GO, Messy Mapping, and Augmented Reality as Archive

To date, using Pokémon GO as a research tool has been explored mainly in the context of orientation skills - for example, navigating cities (Carrera, Saorin and Medler 2018) and assessing health (Howe et al. 2016). Studies on play and Pokémon GO are less common, but there are many that explore augmented-style games in general (Saker and Evans 2016; de Souza e Silva and Hjorth 2009, de Souza e Silva and Sutko 2008). However, there is little literature focused on GO used specifically as a tool for the

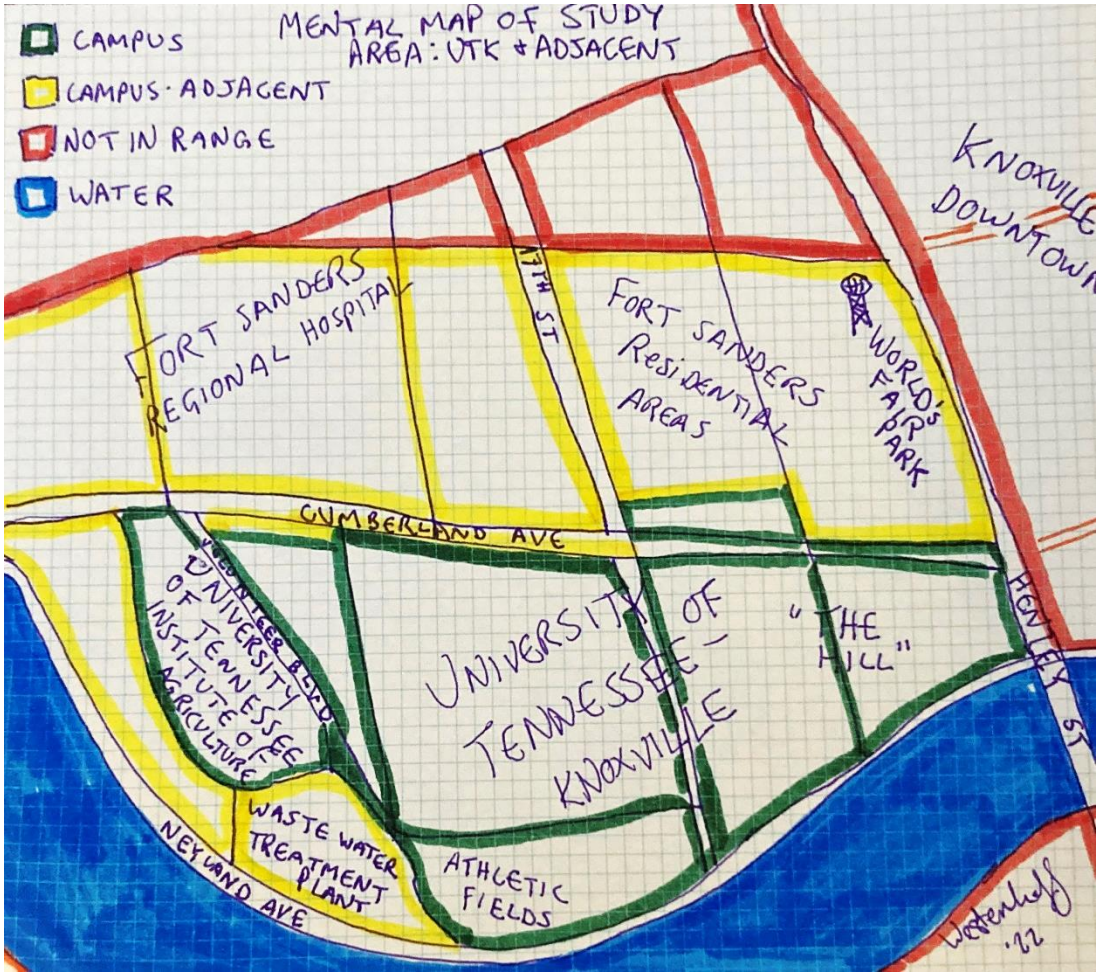


Figure 3.1. Hand-drawn map of the University of Tennessee-Knoxville campus and adjacent areas in the spirit of "messy mapping".

purpose of understanding. One of the first to explore how GO impacts route decisions only came out this spring (Guo et al., 2022, for example).

PokéStops have specific criteria upon which they can be based. They must only refer to manmade features, and they must be outside a certain specific distance of other PokéStops, set internal to the application and unavailable for users to see. Features suggested for new PokéStops are variously described as:

> *"A location with a cool story, a place in history or educational value; An interesting piece of art or unique architecture (Statues, paintings, mosaics, light installations, etc.); A hidden gem or hyper-local spot; Public parks; Public libraries; Public places of worship; Major transit stations hubs (like Grand Central Station)"* (Niantic Inc., n.d.).

While the main purpose of GO remains to capture Pokémon, the eponymous digital creatures, PokéStops are where users gain items used for healing injured Pokémon, befriending distrustful Pokémon, and networking with other users in multi-user challenges. Thus, these features of interest are critical for advancement in the game, and are frequently seen on the landscape.

With such a wide range of possible areas for interaction, student data was anticipated to be complicated, diverse, and potentially problematic to parse. Turning to pedagogical analysis methods for assistance, "messy mapping" was of particular interest. Essentially, mental mapping of one's landscape, in this case Magner's (2022) students' landscape, by placing the features of a novel set within their city allowed a creative outpouring of cartographic internalized knowledge sketched onto the page. Anacta (2020) contributed similar sketch map research, but neither used GIS to further explore these results.

It is unavoidable in any research project conducted in the last four years to not be at least tangentially affected by the global pandemic, even at the local scale. I was fortunate to turn my courses online almost immediately and without particular difficulty, but for analyzing these student paths and mobilities, I needed a post- or during-COVID framework in which to think of senses of place. David Bissell at the University of Melbourne outlines several major structures in which place, and our emotional connections to it, have been changed by this worldwide phenomenon (2021). Global senses of place, especially in the context of space-time compression, were altered by the grounding, in large part, of international travel and distribution of goods (p. 152). Bissell also ties this to conceptions of mobility; while previously, mobility could be seen as a positive and unthreatening trait, it is "the mobility of other people that is threatening" in the present in a global sense. A "looped" sense of place is Bissell's next characterization, in which daily space-time paths of movement, set in large part as routine, are disrupted, potentially permanently, by the pandemic; for those that have this disruption become permanent, Bissell articulates this as a "capsular" sense of place (p. 155). I see some elements of this looping in pre-COVID analysis, but very little in the post-COVID period. Lastly, an "uncertain" sense of place (p. 156) is what I see the most in the student

work post-COVID, as I will discuss further in the results portion of this work. Bissell argues that "some of the more desperate attempts to make things feel normal end up seeming utterly bizarre….it perhaps also tells us something more fundamental about the limits of power…in the face of a situation of overwhelming complexity" (p. 157). The aspect of confusion and uncertainty is manifest in what students consider to be "campus-adjacent," most notably, but also in the sheer range of movement visible upon the return to the university campus in the Fall of 2021.

Another key aspect to the theory behind this paper is that of GO sites acting as, ostensibly, an archive - sites selected as significant for particular reasons. What is included and what is not in the landscape as a whole contains several assumptions. Touching on this briefly with Hannah Soblo (2022) in which we termed GO an "archive of location-based representation", I return to this conceptualization in order to underline the role these sites of interest play in the landscape. Not every site at the University of Tennessee that is marked as a PokéStop is extant in the physical world; an example of this is the Carousel II (Figure 3.2), a former gay bar in the Fort Sanders neighborhood just north of the main university campus. It is listed as a PokéStop, but had closed in 2014 - two full years before Pokémon GO was launched. It is not the only such feature, but it sparked an interest in my first year at the university as to how such archive spaces are curated, maintained, and/or revised.

Considering these sites in GO as archive entries brings forward questions about who is allowed to contribute to the archive - distributed power as a mechanism has been discussed previously (Westenhoff and Soblo, 2022), but there is an additional aspect of gender and racial bias that did not receive as much attention within the context of archive important to highlight. Malik et al (2019) found, in a survey of over one thousand online contributors, that, while there were fewer women who responded, women were found to rank physical exploration as high on their priority list of reasons they enjoy Pokémon GO - however, many studies have documented safety concerns for women, people of color, disabled people, and those in the queer community in particular public places. Tekinbas (2017) was the first to explore this, but it is not a new concept without the particular inclusion of the AR gaming framework. Because there is this walking requirement, and there are rewards for engaging with the landscape, players must go farther and farther afield to achieve more rewards, which can lead players into potentially dangerous situations, as several newspaper articles and headlines documented in late 2016. Treating GO data as an archive is, therefore, only accurately reflective of a subsection of players - those who can go into places without fear of safety, or those who remain unaware of potential danger to their person. The landscape is reflective of that - once again, Schein's "discourse materialized" (1997) in line with gendered and racial expectations in the American Southern university.

A final direction in which I framed the initial assignment is in the context of walkability. Though it is largely associated with urban planning, geographers use walkability as a metric to understand societal and demographic questions regarding



Figure 3.2. While this venue closed in 2014, it is still included in the "archive" of the augmented landscape in Pokémon GO.

access and mobility, among many other dimensions. In a general sense, urban geographers have long grappled with the questions of walkability; two hundred years ago, French poet Baudelaire described the "flaneur", a figure of leisure that walked the landscape for, seemingly, his own enjoyment. While it may not be immediately visible as related to walkability, this very much frames what is considered an "acceptable" figure in walking spaces. Flaneurs, as Shaw (2020) points out, are exclusively male, and exclusively from a particularly wealthy state of income. Leisure for leisure's sake is a rare option for the majority of those living and working in the city. Walkability focuses more on finding ways to make existing infrastructure more accessible, more interesting, and more reasonable than a different means of transportation; however, the death of the flaneur has been, multiple times, declared (Shaw, 2020). In the United States, especially, the emphasis on personal transportation and urban sprawl combined has resulted in few if any truly "walkable" environments. The university campus, for those who live on-campus, may be one of the last examples of such a space that could at least theoretically offer a means for which flaneurs may, once again, exist. Walkability research, however, is mostly seen to focus on what currently exists for those who use it, not asking about questions of initial *access.* Urban geographers have long focused on these questions, but have not always interacted with physical movement through the space as their driving concept. In designing my projects for students, I wanted them to think along both of these aspects to their campus; was it one that was easily navigable, helpful to their needs? Or if not, what was the problem - what needs to change?

Fieldwork and Results

Method

Over the course of three different semesters of GEOG 101, two given online and one given half-online, half in person in the first months of COVID, I required students to complete one of two possible semester projects. Those who wished to complete the GO assignment were required to walk their typical route to campus, compile a table that compared PokéStops to each other, and then complete a minor essay on a PokéStop that interested them. Depending on the semester and size of the class, as well as the modality of class, I required different numbers of PokéStops from them. Of those who completed the project while living in Knoxville and/or on-campus, I archived those projects post-semester, and hired a graduate student to anonymize them over the spring semester of 2022. I supplemented this data with a project-generated database of features of interest that are also PokéStops, compiled by Upward Bound high school students learning GPS techniques over the summer of 2021.

To understand these trends, I used frequency analysis and kernel density analysis within ArcGIS. When a student listed a particular location in their data table, that information was added to a master document in which all locations were collected. This also kept count of the number of times particular locations were listed. The most-visited spots differed in each of the three time periods under investigation, as did what was considered by students to be "adjacent" to campus.

For the purposes of this research, I considered the Fort Sanders neighborhood directly north of the main UTK campus, as well as the UTIA campus, to be campus-adjacent. Anything east of 11th and anything west of Volunteer was considered "out of bounds" and no longer campus-adjacent. The physical geography of the Tennessee River and built railroad infrastructure provided precise boundaries for the remainder of the division of space, largely to the north and south. These boundaries are visible in Figure 3.1. While those boundaries are not explicitly drawn in the following analyses, they are easily determinable by the latent topography and built environment.

Fall 2019

In the first round of data collection for this project, students generated 333 points of data that were PokéStops. The majority of these were campus-adjacent; some areas of interest outside the campus-adjacent requirement included the University of Tennessee Medical Center fountain, the Sunsphere, and Victor Ashe Park. While these first two I consider within the realm of possibility for a campus commute, to walk from Victor Ashe to the university campus (which was the emphasis for the assignment) would take approximately 90 minutes to two hours in each direction. It is not entirely impossible, but certainly unlikely, that a student would make this commute on foot each day.

The most highly-selected site was the university library, John C. Hodges, as well as the "Centaur" long-running exhibit on the first floor of the library space. The most-visited site that was not truly on-campus was the Fort Sanders South Plaque, located at the intersection of Cumberland and 16th. As it is on its way to the majority of campus destinations, this is, again, not surprising.

A minor frustration with data collected from assignments was in the initial movement analysis being thwarted by a large number of students attempting to "clean" their data. I asked them to document their walks, but many students leaned towards exploring their campus landscape instead - at least, that is what is suggested by the site selection. This is not especially surprising, considering Pokémon GO is structured around outdoor exploration, but this created a significant amount of distortion in the "looping" sense of place I was attempting to see (Bissell, 2021). The reason I think this is likely is due to the predominance of historical markers in particular being sites of interest, including monuments that are otherwise obscure in the landscape. It has also been suggested also that students may have compartmentalized what they considered their "routine" from their "project" - the project was, perhaps, to be completed separately due to the way they themselves considered it to relate to daily movements.

Turning to kernel analysis, the cluster areas are clearly only in the eastern portion of the university campus structure, largely centered around the Student Union and locales within close reach. While some students traveled further afar, the majority of the student body that completed this work remained in "familiar" environments. Statistical analysis determined the significance of such data. Using the Average Nearest Neighbor method, the students' submissions were determined to be statistically significant in the clustering of their selections. Although 0.05 as the "p-value cutoff" is arbitrary, it is the standard

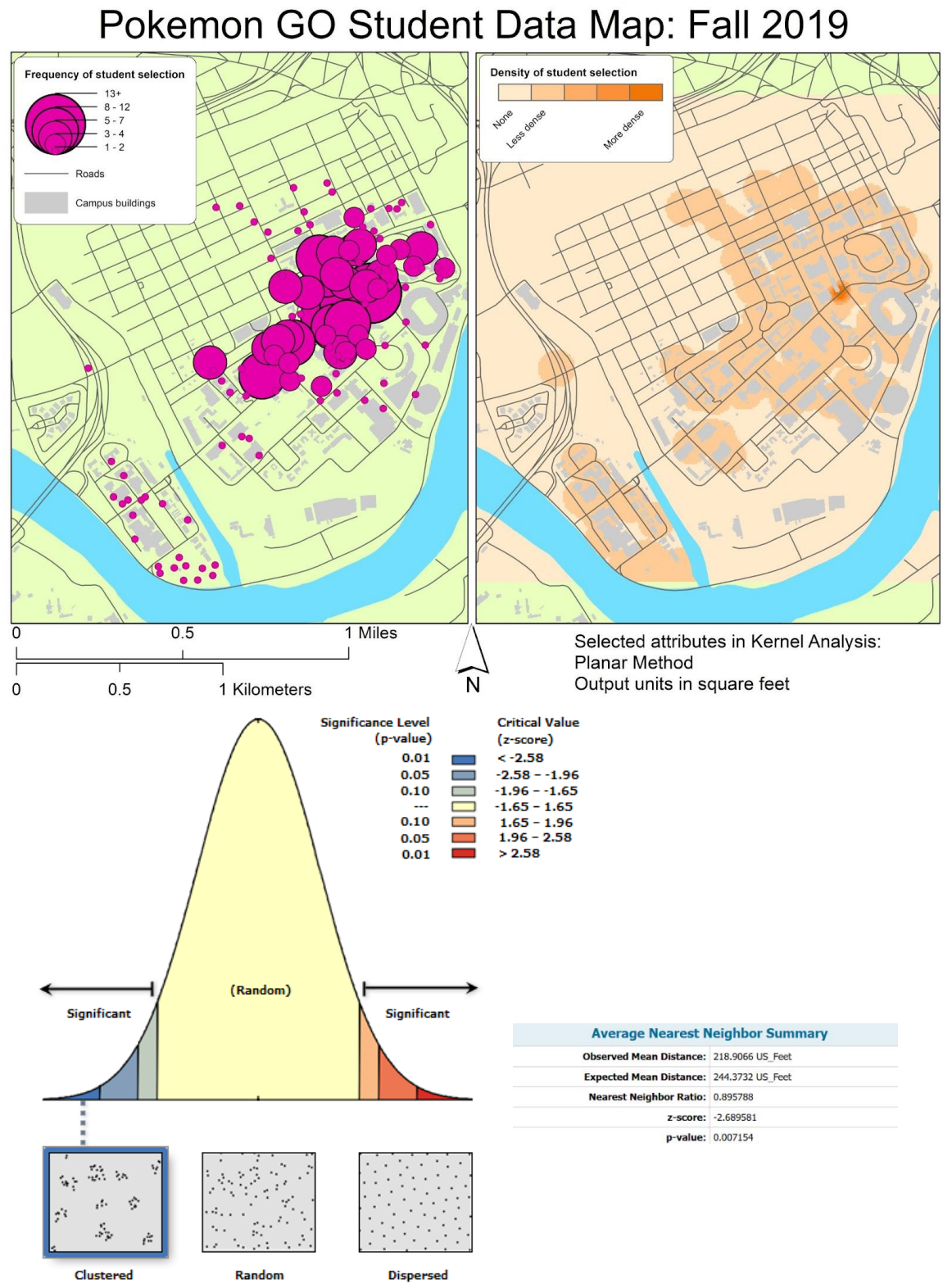


Figure 3.3. Analysis conducted on Fall 2019 student-generated data.

expectation in analysis as significant. By this analysis, these could not be anything other than selected, clustered movements, which means that the students were choosing deliberate paths and "sites of interest". Results are shown in Figure 3.3 via a simple graduated symbol map to the left and a kernel density analysis to the right; statistical analysis demonstrating Average Nearest Neighbor is included below the cartography.

Spring 2021

Once in-person outdoor gatherings were once again considered permissible, I was surprised by the number of students who chose this as an option over others. In this round of data, students generated over a thousand individual datapoints, and more importantly, a significant number of those generated were *not* campus-adjacent. What "campus-adjacent" meant had, clearly, shifted away from the Fort; some listed home churches that were clear across town, while others listed various sites within the Knoxville downtown. Neither had been selected by previous students, and while I can see the theoretical connection between the university and downtown, it is not part of the data analysis here.

Of the data that was actually campus-adjacent, roughly 700 points were analyzed to determine their statistical bearing. There is a visible difference in clustering between the previous semester of data and this one; while there is still a concentration of interest near the Student Union, there are many *more* "clusters" to be seen, largely shifting in the direction of student housing. I theorize that this may be a version of "spring fever" after remaining inside for so long; students went farther, but also considered their dormitories a "home-space" to be recognized as such.

Running Average Nearest Neighbor on this set of submissions produced a similar result, but perhaps to a slightly lesser degree. Students still demonstrated this clustering and therefore potentially the selection we hoped to see, but the severity of clustering was not as strong. Regardless, the p-value is significant and thus these are not random patterns - they do possess direction. These results are visible in Figure 3.4.

Fall 2021

Student data for the fall of 2021 was the last group from which I collected material. These students were, perhaps, on a university campus for their first time while being in their third year at a university; they generated 261 datapoints in their projects. Only about 20 students chose this over the other parallel assignment option; perhaps this indicates when Pokémon GO lost its "cool" factor, or perhaps there are more similarities to the two data projects in the fall than in a pre- and post-Covid perspective. In their kernel density map, it is visible to the naked eye that student interests and living locations were clustered more along the "athletic corridor" - an area that runs parallel to Cumberland, but on the campus, in which several new dormitories and the student gym area are available. Campus construction also had ended over that summer, resulting in a newly-refined, potentially more walkable space.

Students in this group rarely focused on off-campus areas. Again, the difference here between the spring and fall was fascinating in the scaled-down perspective students

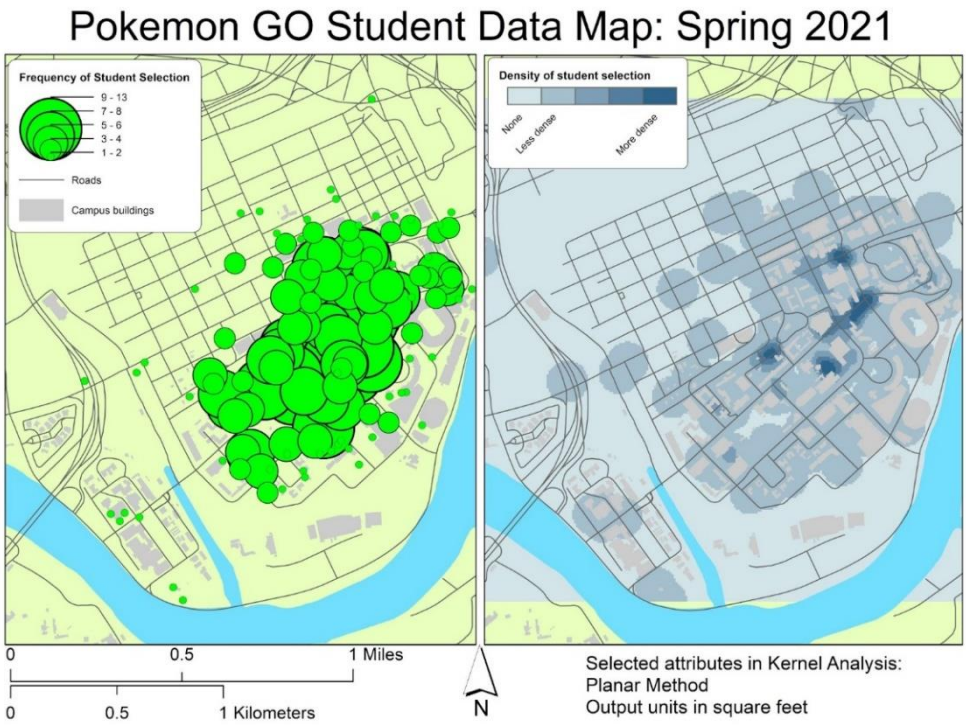


Figure 3.4. Maps demonstrating Spring 2021 student-generated data.

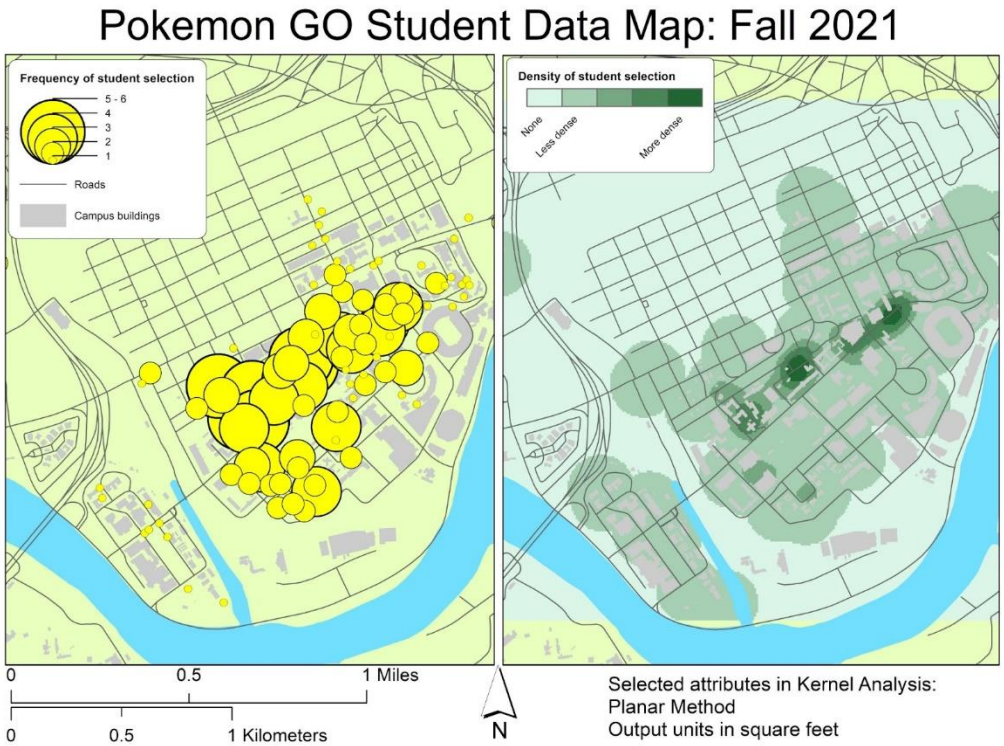


Figure 3.5. Maps demonstrating Fall 2021 student-generated data.

seemed to engage in; a handful of students ventured into the Knoxville downtown once more, but the majority of these students did not seem to agree with what had previously been wide-flung as "campus-adjacent" and largely stayed in the spaces on-campus housing would reflect.

Looking at the Average Nearest Neighbor statistic, this data was statistically significant to a degree stronger than either of the previous groups of projects. There is the possibility that, while there are 200+ datapoints listed, this is insufficient for ANN, as it requires a large number of datapoints and the other two sets of data were more robust in number. Regardless, these results are visible in Figure 3.5.

Observations and Conclusions

Looking at these three groups of students - one pre-COVID, two post-COVID, but with very different perspectives on where "campus-adjacent" begins and ends - there are some key observations that we can make and connect, hopefully, to Bissell's conception of COVID senses of place. In the first round of student submissions, there were some elements of consideration to see a "looped" sense of place as predominant. Students were not changing their routes, going out of their way to explore - as asked for. However, that "uncertain" sense of place is immediately apparent in the spring semester once students could return to the university space. It is as if there were suddenly no lines or directions in which students could draw separation; all of the university and all of Knoxville were, in this uncertainty, fair game to be part of their analyses.

The return in the last grouping here is interesting, but to me, points not to that loop in the initial data gathered, but rather, a *capsular* sense of place. Students in this group were, most likely, first year students who had not had a relationship to the landscape. The capsule they were comfortable with - the dormitory, the gym, and the dining hall, perhaps - is where they felt they could be the most comfortable in such a new environment. Looping implies movement, a destination *to* and *from*; I do not see that nearly as much in this third set of datapoints from these students as those "core" points and destinations, with everything else being very much external and *not* part of their walking experience.

Walkability was part of the design of these projects, and while I cannot say these student submissions created a window in which they could find an excitement for walking itself, the release seen by the students in the last grouping is undeniably there. Walkability or stir-craziness - but certainly a higher level of engagement and enthusiasm - are visible in the sheer range of exploration on the campus landscape.

Pokémon GO teaches students, and that also, I would argue, is visible. Students using the app found new destinations and venues of value, and potentially even helped them find their way to new buildings and halls on campus. However, the conception of who constructs that space, and how that may be visible/invisible to students in their walking paths around campus, is of particular interest. It would be interesting in the future to conduct similar work, but retain the data regarding gender in particular; it was

eliminated in order to preserve anonymity, and rightly so with fewer cases in the last semester of analysis.

In regards to my research questions, the data analysis provides some interesting directions in which to pursue future work, especially on campus accessibility and safety, through an augmented research perspective. Did we see patterns? Yes - and statistically significant ones. But *why* these patterns are the way they are, especially directly post-Covid, will require a far different structure of study. Theorizing is part of this, but finding out if and how students retained the notions of walkability and mobility is the next portion of work to pursue here.

CONCLUSION

As this dissertation closes, I return to fundamental questions mentioned in the introduction to these chapter/articles - *what is there, what is its purpose, and who is it for* – referring to the basic mechanics underlying the functions of augmented reality, place, and landscape. What exists is recounted in each individual area by the focus on site; what its purpose is becomes more complicated, but theoretical framing, especially in the context of cultural geography, answer some aspects to this second question. Who the site or situation is for is not one to answer here, nor can it be truly answered, as it is subjective, but these chapter/articles serve to create avenues in which this question can be asked with more specificity and direction.

Without augmented reality as a part of each of these individual studies, they could not have received the focus and attention to the complexities of the landscapes in question. In Arlington National Cemetery, the memorials reiterate a specific narrative of collective honor and reverence, but the augmented landscape offers a look at those buried there outside this enforcement. Moving from a destination to the local in the Knoxville/UTK area, the purpose of each of these artistic and creative spaces would not have received the questioning they did, should the augmented landscape, in this case, not provide a clear representation of the sites in question. While these sites cannot be different from each other in scope and scale, the augmented landscape served a similar role in deconstructing the surface-norms, though with very different conclusions to be drawn.

Perhaps the work that stands apart the most is the last entry in this chapter/article series. Pedagogy and student engagement, especially for those experiencing the landscape differently than the student body has before, creates a window into understanding augmented landscapes differently, especially in light of the global pandemic. While this work is only able to answer very specific questions from the data available, the statistical significance presented here is exciting and innovative, pushing against the somewhat-rigid boundaries constructed between geographic subdisciplines.

The studies are, truly, quite different from each other, but I also argue that this ultimately reiterates the variability of use that AR can provide. I look forward to doing this work in the future and incorporating these liminal conceptions of landscape into research and the classroom equally.

REFERENCES

Agnew, J. (1987). *Place and Politics: The Geographical Mediation of state and society.* Routledge.

Alderman, D. H. (2015). When an Exotic Becomes Native: Taming, Naming, and Kudzu as Regional Symbolic Capital. *Southeastern Geographer, 55* (1), 32-56.

Alderman, D. H. (2000). A Street fit for a King: Naming Places and Commemoration in the American South. *Professional Geographer, 52* (4), 672-684.

Alderman, D.H. and Inwood, J. (2013). Street naming and the politics of belonging: spatial injustices in the toponymic commemoration of Martin Luther King Jr. *Social & Cultural Geography, 14* (2), 211-233.

Anacta, V. J. (2020). Learning Unfamiliar Routes with Relative and Absolute Instructions: Analyzing Human Wayfinding Performance and Sketch Maps. *Journal of Geography, 119* (6), 226-237.

Arlington National Cemetery. (n.d.). *Explore the Cemetery.* https://www.arlingtoncemetery.mil/Explore

Arlington National Cemetery. (n.d.). "News: a note about section 60 mementos." https://arlingtoncemetery.mil/Media/News/Post/1904/A-Note-about-Section-60-Mementos

Arlington National Cemetery. (n.d.). "Section 27." https://www.arlingtoncemetery.mil/Explore/History-of-Arlington-National-Cemetery/Section-27

Arlington National Cemetery. (n.d.). "Section 60 mementos." https://www.arlingtoncemetery.mil/Funerals/Visiting-a-Gravesite/Section-60-Mementos

Arlington National Cemetery. (n.d.). "Tomb of the unknown soldier." https://www.arlingtoncemetery.mil/Explore/Tomb-of-the-Unknown-Soldier

Arlington National Cemetery. (n.d.). "Visitor etiquette." https://www.arlingtoncemetery.mil/Visit/Visitor-Tips

Azuma, R. T. (1997). A Survey of Augmented Reality. *Presence: Teleoperators and Virtual Environments, 6* (4), 355-385.

Bell, M. M. (1997). The ghosts of place. *Theory and Society,* 26 (6), 813-836.

Bissell, D. (2021). A changing sense of place: Geography and COVID-19. *Geographical Research* 59, 150– 159.

Brasher, J.P., Alderman, D.H. and Inwood, J.F. (2017). Applying critical race and memory studies to university place naming controversies: Toward a responsible landscape policy. *Papers in Applied Geography*, *3*(3-4), 292-307.

Britain, D. (2013). Space, Diffusion and Mobility. In *The Handbook of Language Variation and Change*, eds J. K. Chambers and N. Schilling, 471-500. John Wiley and Sons, Incorporated.

Carbonell Carrera, C., Saorín, J.L. and Hess Medler, S. (2018). Pokémon GO and improvement in spatial orientation skills. *Journal of Geography, 117* (6), 245-253.

Connerton, P. (2010). *How Societies Remember.* Cambridge University Press.

De Souza e Silva, A. and Hjorth, L. (2009). Playful urban spaces: A historical approach to mobile games. *Simulation & Gaming*, *40* (5), 602-625.

de Souza e Silva, A., Sutko, D. M. (2008). Playing Life and Living Play: How Hybrid Reality Games Reframe Space, Play, and the Ordinary. *Critical Studies in Media Communication,* 25 (5), 447-465.

Dobak, W. (2011). *Freedom by the Sword: The Official Army History of the US Colored Troops, 1862-1867.* Center of Military History, United States Army Press.

Doss, E. (2010). *Memorial Mania.* University of Chicago Press.

Dwyer, O. (2004). Symbolic Accretion and Commemoration. *Social & Cultural Geography*, 5, 419-435.

Foote, K. (1997). *Shadowed Ground.* University of Texas Press.

Graham, M., Zook, M., and Boulton, A. (2013). Augmented Reality in Urban Places: Contested Content and the Duplicity of Code. *Transactions of the Institute of British Geographers*, 38, 464-479.

Guo, Y., Peeta, S., Agrawal, S. and Benedyk, I. (2022). Impacts of Pokémon GO on route and mode choice decisions: exploring the potential for integrating augmented reality, gamification, and social components in mobile apps to influence travel decisions. *Transportation*, *49* (2), 395-444.

Historic Tours of America. (n.d). *Washington DC Tours with Historic Tours of America.* https://www.historictours.com/washington/index.php

Howe, K.B., Suharlim, C., Ueda, P., Howe, D., Kawachi, I. and Rimm, E.B. (2016). Gotta catch'em all! Pokémon GO and physical activity among young adults: difference in differences study. *British Medical Journal*, 355.

Howell, E. (2017). Pokémon GO: Implications for Literacy in the Classroom. *The Reading Teacher, 70* (6), 729– 732.

Hunt, D., and Stevenson, S. (2017). Decolonizing Geographies of Power: Indigenous Digital Counter-Mapping Practices on Turtle Island. *Settler Colonial Studies, 7* (3), 372-392.

Jaffe, G. (2013, October 1). Cleanup in Arlington National Cemetery's Section 60 upsets families of war dead. *The Washington Post*. https://www.washingtonpost.com/national/cleanup-in-arlington-national-cemeterys-section-60-upsets-families-of-war-dead/2013/10/01/ec5de34e-2ac4-11e3-97a3-ff2758228523_story.html?itid=ap_gregjaffe

Jaworski, A., and Thurlow, C. (2010). *Semiotic Landscapes: Language, Image, Space*. Bloomsbury.

Johnstone, B. (2009). Pittsburghese Shirts: Commodification and the Enregisterment of an Urban Dialect. *American Speech, 84* (2), 157–175.

Kurashige, S. (2011). From "Yellow Peril" to "Model Minority": Japanese Americans and Racial Ideology in US History. *Rikkyo American Studies, 33*, 57-74.

Landry, R., and Bourhis, R. (1997). Linguistic Landscape and Ethnolinguistic Vitality: an Empirical Study. *Journal of Language and Social Psychology, 16* (1), 23-49.

Lange, K. (2017, October 8). The Challenge Coin Tradition: Do You Know How It Started? *DOD News*. https://www.defense.gov/News/Inside-DOD/Blog/Article/2567302/the-challenge-coin-tradition-do-you-know-how-it-started/

Lee, J., Yip, J., Moore, A., Cho, Y., de Jong, Z., Kobashigawa, R., & Escalera Sanchez, A. (2023). Users' Perspectives on Ethical Issues Related to Playing Location-Based Augmented Reality Games: A Case Study of Pokémon GO. *International Journal of Human–Computer Interaction, 39* (2), 348-362.

Leib, J. (2011). Identity, Banal Nationalism, Contestation, and North American License Plates. *Geographical Review, 101* (1), 37-52.

Light, D. (2014). Tourism and toponymy: commodifying and consuming place names. *Tourism Geographies, 16* (1), 141-156.

Loukas, C. (2022, September 15). As UT students struggle with parking, university says there are still spaces. *WBIR*. https://www.wbir.com/article/news/community/university-of-tennessee-parking-issues-2022/51-7edd85bc-a456-4e4d-899a-6e71aa773cb2

Lupton, Q. (2017). Pokémon in the midst: Collecting and using data from within the Pokémon GO ecosystem to facilitate ecology and wildlife biology education. *The American Biology Teacher*, *79* (7), 592-593.

Magner, B. (2022). Messy mapping: activating student lifeworlds through the handmade visual analysis of a literary text. *Journal of Geography in Higher Education*, *46* (3), 403-426.

Malik, A., Hiekkanen, K., Hussain, Z., Hamari, J., & Johri, A. (2019). How players across gender and age experience Pokémon Go? *Universal Access in the Information Society, 19,* 799 - 812.

Mark, D. Turk, A., Burenhult, N., and Stea, D. (2011). *Landscape in Language: Transdisciplinary Perspectives*. John Benjamins Publishing.

Massey, D. (1994). *Space, Place, and Gender*. University of Minnesota Press.

McElya, M. (2016). *The Politics of Mourning.* Harvard University Press.

Menton, L.K. (1994). Nisei Soldiers at Dachau, Spring 1945. *Holocaust and Genocide Studies, 8* (2), 258-274.

Merriman, P., Revill, G., Cresswell, T., Lorimer, H., Matless, D., Rose, G., & Wylie, J. (2008). Landscape, mobility, practice. *Social & Cultural Geography*, *9* (2), 191-212.

Merriman, P., Jones, M., Olsson, G., Sheppard, E., Thrift, N. and Tuan, Y.F. (2012). Space and spatiality in theory. *Dialogues in Human Geography*, *2* (1), 3-22.

Micieli-Voutsinas, J. (2017). An absent presence: Affective heritage at the National September 11th Memorial & Museum. *Emotion, Space and Society,* 24, 93-104.

Moreau, T., and Alderman, D. (2011). Graffiti Hurts and the Eradication of Alternative Landscape Expression. *Geographical Review, 101*, 106-124.

Morita, H. (1992). The Nation's Most Decorated Military Unit--The 100th/442nd Regimental Combat Team. *US Army War College*.

Murphy, R. and Stephens, T. (2020). *Section 27 and Freedman's Village in Arlington National Cemetery.* MacFarland and Company.

Naming Commission. (2021). *Part III: Remaining Department of Defense Assets.* https://drive.google.com/file/d/17hGFylLlQU52W8JHXXqMo3eEDsf781Ra/view

National Parks Service (n.d). Japanese-American memorial to patriotism during World War II U.S. *Department of the Interior.* https://www.nps.gov/places/ japanese-american-memorial-to-patriotism-during-world-war-ii.html

Niantic, Inc. (n.d). "What Makes a Place or Object Eligible to be a Wayspot?" https://wayfarer.nianticlabs.com/criteria#eligibility.

Office of Internal Research and Assessment (2022). *Common Data Set 2021-2022. University of Tennessee-Knoxville.* https://oira.utk.edu/wp-content/uploads/sites/66/2022/07/ CDS_2021-2022_Full.pdf

Poole, R. M. (2016). *Section 60.* Bloomsbury.

Post, C. W., and Alderman, D. (2014). "Wiping New Berlin Off the Map": Political Economy and the De-Germanisation of the Toponymic Landscape in First World War USA. *Area,* 46 (1), 83-91.

Preston, D. R. (2013). Language With an Attitude. In *The Handbook of Language Variation and Change,* edited by J. K. Chambers and Natalie Schilling, 157-182. John Wiley and Sons, Incorporated.

Puzey, G. (2016). Linguistic Landscapes. In *The Oxford Handbook of Names and Naming*, ed Carole Hough, 395–411. Oxford University Press.

Saker, M., and Evans, L. (2016). Everyday life and locative play: an exploration of Foursquare and playful engagements with space and place. *Media, Culture and Society*, 38 (8), 1169-1183.

Salen Tekinbaş, K. (2017). Afraid to roam: The unlevel playing field of Pokémon Go. *Mobile Media & Communication*, 5(1), 34-37.

Schein, R.H. (1997). The place of landscape: A conceptual framework for interpreting an American scene. *Annals of the Association of American Geographers, 87* (4), 660-680.

Shaw, D. B. (2015). Streets for cyborgs: The electronic flâneur and the posthuman city. *Space and Culture*, *18* (3), 230-242.

Shinkle, K. (2022, June 11). "How many people still play Pokémon GO in 2022." *Screenrant.* https://screenrant.com/pokemon-go-active-players-how-many-popular-2022/

Tyner, J., Inwood, J., and Alderman, D. H. (2014). Theorizing Violence and the Dialectics of Landscape Memorialization: A Case Study of Greensboro, North Carolina. *Environment & Planning D: Society and Space*, *32*, 902–914.

Veterans Affairs Montana (n.d.). "Coins on headstones meaning." https://dma.mt.gov/MVAD/MVAD-Images/Coins-on-headstones-meaning.pdf

Westenhoff, L., and Soblo, H. (2022). Static Sites, Dynamic Spaces: Space-time flattening of place through Pokémon GO. *Material Culture, 54* (2), 41-58.

Wilusz, R. (2020, April 18). "The Dolly Parton Mural was Defaced. So What Happens Now?" *Washington Times*. https://www.washingtontimes.com/news/2020/apr/18/the-dolly-parton-mural-was-defaced-so-what-happens/

Young, N. (2020). Pokémon GO in the Field: Digital Gaming Apps and Ethnographic Methods. *Journal of Folklore Research 57* (3), 63-86.

APPENDIX: TABLES

Table 1.1. Textual Frequency Analysis: sites from arlingtoncemetery.mil

Grouped category	Unique word entries	Total frequency
Funeral	65	2967
Military	49	1993
Administration	40	901
Tourism	39	636
Accessibility	5	91

Table 1.2. Image Coding Analysis: images used on arlingtoncemetery.mil.

Grouped Category	Unique Images	Example Image
Headstones	47	
Funeral proceedings	24	
Plants/vegetation	19	

Table 1.2 Continued

Tomb of the Unknown, McClellan Arch, or Memorial Amphitheater	12	
Tourists	8	
Other memorials and monuments	6	
Logos	4	

Table 1.2 Continued

Military members not in funeral proceeding	3	
Wreath laying	3	
Explorer app	3	

Table 1.3: Monuments and Memorials as listed by Arlington via Ground-truthing

Memorials Listed on Website	Section	Easy to find?
Apollo 1	3	No
Argonne Cross (World War I)	18	Yes
Battle of the Bulge Memorial	22	Yes
Beirut Barracks Memorial	59	No
Canadian Cross of Sacrifice	46	Yes
Chaplains Hill Monuments	2	Yes
Coast Guard Memorial	4	No
Confederate Memorial	16	Inaccessible
Sir John Dill Memorial Grave	32	Yes
Iran Rescue Mission Memorial	46	Yes
Major General Philip Kearny Memorial Grave	2	Yes
President John F. Kennedy Memorial Grave	45	Yes
Robert F. Kennedy Grave	45	Yes
Korean War Memorial Contemplative Bench	48	Yes
McClellan Gate	12	Yes
Memorial Amphitheater	7A	Yes
Nurses Memorial	21	No
Office of Strategic Services Memorial	2	No
Pan Am Flight 103 Memorial Cairn (Lockerbie)	1	Yes
Pentagon Group Burial Marker (9/11)	64	Yes
Rough Riders Memorial	22	No
General Philip H. Sheridan Memorial Grave	2	No
Space Shuttle Challenger Memorial	46	Yes
Space Shuttle Columbia Memorial	46	Yes
Spanish-American War Memorial	22	No
Spanish-American War Nurses Memorial	21	Did not find
President William Howard Taft Memorial Grave	30	Yes
Tanner Amphitheater	26	Yes
Third Infantry Division Memorial	46	Yes
Tomb of Civil War Unknowns	26	Yes

Table 1.3 Continued

Tomb of the Unknown Soldier	7A	Yes
USS Maine Memorial	24	Yes
USS Serpens Memorial	34	No
USS Thresher National Commemorative Monument	2	No
Vietnam Helicopter Pilot and Crewmember Monument	35	Yes
Woodhull Memorial Flagstaff	35	Yes

Table 1.4: Monuments and Memorials as listed by Arlington - PokéStop Categorization

Memorials Listed on Arlington's Official Website	Section	Easy to find?	PokéStop?
Apollo 1	3	No	No
Argonne Cross (World War I)	18	Yes	No
Battle of the Bulge Memorial	22	Yes	No
Beirut Barracks Memorial	59	No	Yes
Canadian Cross of Sacrifice	46	Yes	No
Chaplains Hill Monuments	2	Yes	Yes (two)
Coast Guard Memorial	4	No	No
Confederate Memorial	16	Inaccessible	Yes
Sir John Dill Memorial Grave	32	Yes	No
Iran Rescue Mission Memorial	46	Yes	No
Major General Philip Kearny Memorial Grave	2	Yes	Yes
President John F. Kennedy Memorial Grave	45	Yes	Yes
Robert F. Kennedy Grave	45	Yes	Yes
Korean War Memorial Contemplative Bench	48	Yes	Yes
McClellan Gate	12	Yes	Yes
Memorial Amphitheater	7A	Yes	Yes
Nurses Memorial	21	No	No
Office of Strategic Services Memorial	2	No	No
Pan Am Flight 103 Memorial Cairn (Lockerbie)	1	Yes	No
Pentagon Group Burial Marker (9/11)	64	Yes	Yes
Rough Riders Memorial	22	No	No
General Philip H. Sheridan Memorial Grave	2	No	No
Space Shuttle Challenger Memorial	46	Yes	No
Space Shuttle Columbia Memorial	46	Yes	No
Spanish-American War Memorial	22	No	No
Spanish-American War Nurses Memorial	21	No	No
President William Howard Taft Memorial Grave	30	Yes	Yes
Tanner Amphitheater	26	Yes	Yes

Table 1.4 Continued

Third Infantry Division Memorial	46	Yes	Yes
Tomb of the Civil War Unknown	26	Yes	Yes
Tomb of the Unknown Soldier	7A	Yes	Yes
USS Maine Memorial	24	Yes	Yes
USS Serpens Memorial	34	No	No
USS Thresher National Commemorative Monument	2	No	No
Vietnam Helicopter Pilot and Crewmember Monument	35	Yes	Yes
Woodhull Memorial Flagstaff	35	Yes	Yes

VITA

Lindy C. Westenhoff is a cultural geographer rooted in the GIScience tradition and strongly aligned with interdisciplinary research and its importance. Her work focuses on the multiple conceptions and aspects of landscape, including the digital, physical, cognitive, and augmented; she also works closely with interested groups and community members to create authentic and sensitive conceptions of place. After graduation, Westenhoff will be taking an academic position in a department that values collaboration, interdisciplinary approaches to research, and creative problem-solving. Westenhoff is grateful to the geography and sustainability department at the University of Tennessee-Knoxville, Dr. Jessi Grieser at the University of Michigan, and her fiancée, Jocelyn, for all of their continued support and belief in the worth of the work.