Down the Rabbit Hole

Hololive Myth, community, and digital geographies

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Abstract

Despite the use of digital technologies steadily increasing in all parts of the world, there has as yet been little interest from geographers and planners in developing theories for how digital and physical geographies are interrelated with each other and what this might mean for planning as a profession in the future. In this thesis, I explore how digital spaces can be simultaneously material and immaterial in terms of digital-physical dialectical relationships and how this helps us understand communal spatialities within the digital and between the digital and physical worlds through a combination of observation and auto-ethnographic reflection of the five YouTube communities that follow the virtual idol group Hololive Myth. I establish a theory of community using Tönnies's *Gemeinschaft* and *Gesellschaft*, contextualizing my results using theories of atmospheres, algorithmic governance, and proprioceptive space to understand how a feeling of community is created through the interaction between people and machine, the memorial relationship between them being informed by algorithmic viscosity. These understandings are useful for geographers and planners in showing how online communities can be approached and navigated, for understanding contemporary limitations of publishing when presenting digital results, and reveals previously unconsidered places for planning and regulation.

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Foreword

I was told many years ago by a therapist that it was much more preferable to have friends I could meet in person than over the internet. At the time, I didn't think much of it. It seemed like common sense that proximity is physical and that it should be equated with emotion. I have reflected a lot upon those words and what 'proximity' should mean in the midst of this pandemic. I have friends that I love deeply who live across continents and on the other side of oceans, and talking to them on the phone lets me remember how they smile. I feel how they are missing physically, but they feel all the closer emotionally. I have strangers that live next door to me who I have no emotional attachment to. Some of the closest relationships I've had were voices over Ventrilo dressed in their *World of Warcraft* avatars. It seems like there can be many forms of proximity, that they are related to each other, and that they aren't always equivalent.

As an amateur musician, it comes naturally for me to speak of influences: I moved to a country I barely knew as a teenager and left my friends behind, therefore I think about the proximity between people; I come from a family of artists, builders and engineers, therefore I find it natural to think of built environments and their function as art; I grew up with the internet and have spent years designing applications, therefore I think in terms of interfaces. It is the nature of life that there are far more people to thank than I ever can or will ever know to, especially living quarantined from COVID-19 where relationships, time, and place feels distorted like a hall of mirrors. While I wish I could give a name to everyone and everything who has influenced me, whose ideas I have unknowingly borrowed, or whose help I have received, I cannot. To all of you who have been there and contributed in small ways, thank you.

However, there are some who I can name and have provided their aid while writing this thesis, and it gives me great pleasure to thank them. To my supervisor Natasha, thank you for giving me your invaluable time, knowledge, and enthusiasm whenever we spoke. To my parents Anette and Toby, thank you for always being there and never giving up on me, even when I dropped out of school. It worked out, in the end. To my brother Joar, thank you for your unwavering support and indulging me in my ramblings, and letting me indulge in yours. To my friends Armin and Leo, thank you for being generous with your feedback and for saying it as nicely as possible. To my classmate Matilda, thank you for sending a Zoom link to me when I needed to be held accountable and for letting me believe that I give good advice.

And finally, to the Dead Beats, KFP employees, Shrimp, Takodachi, and Teamates who I may never meet, but I now feel so close to: thank you for creating something special so that I could find it.

Björn Nordvall
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Glossary

Hololive community terms

Chumbuds : The less commonly used name for Gawr Gura's fans.

Clip : A recorded part of a live stream that is created by a 'clipper' and can be 'remixed'.

Clipper : A term for users that record live streams and upload segments of them, called 'clipping'.

COVER Corp. : The Japanese corporation that owns Hololive and Holostars.

Dead Beats : The name for Mori Calliope's fans.

Gawr Gura : A VTuber idol that is part of HoloMyth with the fictional background of a shark.

Hololive Production : A Japanese company that organizes female virtual entertainment talent.

Hololive EN : The English-language part of Hololive.

Hololive Myth (HoloMyth) : The first generation of explicitly English-language virtual entertainment talent for Hololive that debuted in September 2020. Their identities are based on mythological beings.

Holostars : A group of male VTubers that are managed by Hololive Production.

Kiara Fried Phoenix (KFP) : The name for Takanashi Kiara's fans, often in terms of fans being 'employees'.

Mori Calliope : A VTuber idol that is part of HoloMyth with the fictional background of a grim reaper's apprentice.

Ninomae Ina'nis : A VTuber idol that is part of HoloMyth with the fictional background of having found a tome of power.

Shrimp : The more commonly used name for Gawr Gura's fans.

Takanashi Kiara : A VTuber idol that is part of HoloMyth with the fictional background of a phoenix. Can be referred to as *tenchou* (店長), a Japanese term for a shop manager.

Takodachi : The more commonly used name for Ninomae Ina'nis's fans.

Teamates : The name for Watson Amelia's fans.

Tentacult : The less commonly used name for Ninomae Ina'nis's fans.

Watson Amelia : A VTuber idol that is part of HoloMyth with the fictional background of a master detective.

Virtual YouTuber (VTuber) : An online entertainer that uses a virtual avatar as their visual identification.

Vod : A term for an archived live stream.

Online/digital terms

***Aidoru* (アイドル) :** A Japanese term used here to mean a type of celebrity.

Big data : A term that can refer to the size of datasets as well as the processes used to analyze them.

***Chibi* (禿び) :** A Japanese term used here to refer to a drawing style used to emphasize the cuteness of a character.

Computer-mediated communications (CMC) : The technologies that allow for someone to communicate through a computer.

Content creator : Someone who creates content. On YouTube, this takes the form of uploading videos.

Fan-fiction : Fictional, often unlicensed and unpublished, works created by fans that make use of copyrighted material from a known intellectual property.

Graphical user interface (GUI) : The visual components that make up how one interacts with a digital platform.

***Kawaii* (可愛い) :** A Japanese term used here to denote a naïve, infantile cuteness. This term can be applied to the five idols that are a part of HoloMyth.

Live stream : The term used to denote live footage streamed over the internet. It is often associated with video games, but can have any type of content.

Live streamer : Someone who performs on a live stream, either as an amateur or professional.

Lurking : The act of being a part of an online community without announcing one's presence or partaking in its activities.

Massively Multiplayer Online Roleplaying Game (MMORPG) : A genre of multi-user video game.

Multi-user dungeon (MUD) : A genre of multi-user, usually text-based video game.

***Otaku* (オタク, おたく, or ヲタク) :** A Japanese term used here to denote an obsessive fan that devotes most of their time and energy to a particular subject.

Remix : A term that means that media has been adapted in some way from its original source.

Remixer : A user that reconstitutes source materials into a new form.

Thumbnail : A still image used to show the contents of a video on YouTube, either as a still frame from the video or as a customized image uploaded by the creator.

User interface (UI) : The components that make up how one interacts with a digital platform, both what is seen and what is not.

User experience (UX) : The experience of interacting with a digital product.

Voice over internet protocol (VoIP) : A term used for placing voice calls over the internet. Commonly used for services like FaceTime, Skype, and WhatsApp.

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Fig. 10 : The interwoven dialectical relationships of digital and physical socio-spatial geographies.

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1. Introduction

The past several decades has seen a substantial shift towards the use of digital devices in nearly all facets of everyday life (Fraser, 2019), a tendency accelerated by forced or self-imposed isolation during the ongoing COVID-19 pandemic and of the requirements put forward by states seeking to surveil the spread of disease (Kampmark, 2020). Despite this, there has been comparatively little geographic interest in researching a field that has such a large impact both in general and particularly in the form of qualitative study (Ash et al., 2018b). The majority of the research that has been done on the digital has focused on the use of 'big data' and mapping the flow of data, with a recent interest on geographical production 'through' and 'by' the digital, which has in turn left a shortfall of research that deepens our understanding of how relationships and communities are formed and maintained in these spaces that are instead formed 'of' the digital. Indeed, the focus on big data-driven geographical questions and the answers found therein has left a void for qualitative research to be conducted that not only ask 'where' or 'what' affects data flows, but 'how' these individual choices are being made and 'why' the individuals making these choices are making them, regardless of the outcome.

The question of how seems to become only more important given the more than six-and-a-half hours that the around 4.54 billion internet users on average spend online daily, making use of 200 million active websites (of around 1.8 billion total websites) divided into 56.8 billion Google-indexed webpages (G., 2021; Kemp, 2019). Of course, what 'online' actually means can be questioned: eyeballs pointed at a screen is not necessarily the same as 'being' online (boyd, 2012), and it can likewise be understood in terms of more general media interactions (Meikle & Young, 2012). While the amount of time alone that is spent online might make this of academic interest, it does not tell us why it should be of interest to us as geographers or spatial planners, or why we should look at how online communities work in particular.

One aspect is the material requirements of partaking in the digital. Chatting in a chat room, watching YouTube clips, reading Twitter posts, or commenting or posting on Reddit all require infrastructure in order to function: the conversion, storage, and subsequent delivery of electrical energy to electrical outlets, the creation and distribution of the devices that transform this electrical energy into pixels on a screen or convert information sent by cable into waves of parsable data, and the various processes that rely on having access to an ever-present deluge of data (i.e. Ganichev & Koshovets, 2021). The perceived accessibility of the internet informs public policy, which has led to an assumption of equal access that the at time of writing ongoing COVID-19 pandemic has made abundantly clear, and affects constituents differently depending on location, class, race, gender, age, and so on (i.e. Mitchell, 2020; van Deursen, 2020). Regardless of the infrastructure's distribution, digital communities are seeping into public, physical life, from spectacular events—flash mobs performing (i.e. Brejzek, 2010; Duran, 2006), stampedes of people playing *Pokémon Go* (i.e. Jenkins, 2016; cf. Evans et al., 2021), and online communications that explode into violent political action (i.e. Aoun, 2021; Kim, 2020) spring to mind—to the mundane—making a voice over internet protocol

(VoIP) call while walking down the street, reading an ebook on the train, or listening to music while sitting on a bench. They require particular infrastructures to function, but the ubiquity of internet use indicates that physical places and spaces are in part shaped by digital interactions, and vice versa. The intersection of digital and physical can be viewed as a 'lived space', as a 'Thirdspace', or as being 'more or less digital' (Bustin & Speake, 2020; Merrill et al., 2020). One reason to understand digital geographies is, therefore, because physical geographies are impacted by digital geographies.

Hololive Myth is one such multi-space community counting at time of writing roughly 6 million subscribers that follow five live streaming personalities and where individual live streams are regularly viewed hundreds of thousands of times. These communities are both separate from and intertwined with each other, making them particularly useful examples of how digital communities interact with each other. The five communities contain participants from around the globe and are each centered around a personality represented by a virtual avatar, a phenomenon that seems to have started in Japan in 2017 with the virtual YouTuber (VTuber) Kizuna Ai, but also obscures many more complex interactions beneath this surface-level description (Lufkin, 2018). The community makes use of many different online platforms, albeit uniform in the sense of their commerciality, and are accessible through many different types of devices, both indicating the extent to which digital communities and digital places are integrated into the everyday lives of those who use them.

Another reason for the interest might be the newness of these spaces and the potential for developing new understandings of how they work. Dave Healy (in Cordes, 2020) has claimed that cyberspace is the latest or last frontier to be explored, understood, and controlled, while Li et al. (2010) have likened it to Christopher Columbus's perception-altering 'new discovery' of the American continents. If its newness as a space, let alone a field of study, is the reason why it is not studied as geography, it also suggests that we do not know enough to judge whether it should be geography. Of course, while these calls might be enticing to answer immediately—the novelty of exploring and establishing a new field can be difficult to withstand—Ashley Cordes (2020: 286) has cautioned that such theoretical linkages also stem from the creation of borders at the expense of indigenous peoples, noting the potential repercussions of considering the digital in the same way as land, as "a body framed as feminine, as Mother Nature, and as colonizable or rape-able"; a prescient reminder that the history of the terms we use can be just as important as what it is we choose to research.

Concomitantly, it is worth remembering that digital geographies are only new insofar as academic interest in them, and might have decades of history that we should be mindful to understand on their own terms. As Fainstein and DeFilippis (2016: 2) have noted, "Planning must be predictive, and predicting the future impacts of planning interventions requires theoretical understanding of the processes that shape the making of spaces and places", indicating that the newness of a field should not lessen its potential interest in planning, rather that it makes it more interesting for us to develop. Indeed, while Tranos and Nijkamp (2013) have noted the argument that the virtual is inherently non-spatial, they have also proposed that it be understood using spatial terms: as 'cyberspace', cyber-place', information superhighways', or 'virtual reality', among others. I

would venture to say that we as humans seem to default to the approaching digital as something spatial, despite the potential that this establishes a geographical hierarchy when it instead seems like the physical and virtual exist intertwined with one another.

While a niche subculture might not seem useful to a professional planner, the infra-ordinary normality of the interactions that occur in these communities suggest it should be added to what Johnston et al. (2000: vi) have suggested is a historical assumption of polymathy among planners and geographers:

> *"Laurence Echard noted […] that the geographer was by [1691] more or less required to be 'an* Entomologist*, an* Astronomer*, a* Geometrician*, a* Natural Philosopher*, a* Husbandman*, an* Herbalist*, a* Mechanick *[*sic*], a* Physician*, a* Merchant*, an* Architect*, a* Linguist*, a* Divine*, a* Politician*, one that understands* Laws *and* Military Affairs*, an* Herald *[and] an* Historian*'. Marguerita Bowen, commenting in 1981 […], suggested that 'the prospect of adding epistemology and the skills of the philosopher' to such a list might well have precipitated its Cambridge author into the River Cam!"*

A third reason might be to understand to which extent digital geographies are public and private spaces, and how understandings of public/private interact with each other. The dominance of a few large, private, and monopolistic actors as the owners and distributors of the digital platforms that are currently in use can be subject to critique not merely on the grounds of the accessibility of the infrastructure or how they are used, but in the way they regulate an individual's ability to act (i.e. Krisch & Plank, 2019; Pasquale, 2015). This critique seems to have a mirror in the discourse surrounding the 'right to the city' (i.e. Harvey, 2003, 2008; Merrifield, 2011; Purcell, 2014) which argues that the right to access public space should be available for everyone, both in the form of physical access to infrastructure and access to the knowledge of how to use that infrastructure that are outlined by the 'digital divide' debate (i.e. Felgenhauer & Gäbler, 2018; Gunkel, 2003; Mabweazara, 2021; van Dijk, 2006) as well as access to virtual places on the internet that provide the same type of public forum free, as well as any public space can be, of corporate and otherwise oppressive interests. The comparison between digital and physical space through this lens suggests that while we spend more and more time in privately owned digital spaces and interact more and more at the whim of corporate interests, we still lack a meaningful choice beyond whether we participate or not in what has become a vital part of what we call a 'modern' society.

This is not to say that this text will be so comprehensive as to answer all these questions or follow all the approaches they suggest to us. Instead, it is an attempt to raise questions that spatial planners and geographers are equipped to ask, but have only begun considering at depth (Ash et al., 2018b; Herring, 2019). It may be a truism to say that each academic discipline approaches every problem differently, but it suggests that there is crucial value in understanding the digital as geography—as terrain, as landscape, as place, and as space. While it may be navigated, mediated, and presented differently than city or countryside, the digital is no less deserving of attention as a place

where we collectively and individually spend so much time, and so greatly impacts our daily experience.

1.1. Thesis aim

My aim in this thesis is to explore the nature of spaces and places in digital and physical geographies through the lens of community. This focus on community, rather than on infrastructure or platform, should allow for ways to grasp how digital spaces might interact with the physical world and how the process of making communities is a planning issue, and will likely become an increasingly important one in the future. Hololive Myth, as the focus of this study, is a digital multi-space community, and its exploration provides insights for planners and geographers for how digital spaces and places may shape their work and reveal the growing importance of online spaces.

1. In what ways are digital spaces simultaneously material and immaterial?
2. How can we understand and conceptualize the spatialities of digital communal spaces?
3. What lessons can spatial planners and geographers learn from understanding what contemporary online communities look like?

1.2. Thesis outline

This thesis is divided up into chapters that outline the tools that will be used to gather data and provide analysis. In this Introduction, I have provided some broad background for this study and have argued why I think the digital should be approached as an object of interest and study for planning and geography, rather than being reserved for other academic disciplines. I have also outlined the questions that I will explore in this thesis and provided a brief outline of the communities where the data was collected.

In the Theory chapter, I establish my framework for thinking about communities and digital geographies. Because there is a relative lack of digital geographic theory, I have drawn from theories developed in other fields in order to find other ways of understanding that can be applied to geographical theory.

In the Methodology and Method chapter, I describe my ways of thinking and how they led me to select the methods I used to gather the data for the study. I discuss how I approached the particular difficulties studying digital geographies entails. I also detail the limitations of my selected method and other potential ways that this research could be conducted.

In the chapter entitled Findings, I present the results that I have collected and theoretical additions that I have needed to make use of in order to more completely understand what it is that I have observed.

In the Discussion chapter, I discuss the data I have collected and put it in context of my theoretical framework in order to answer the questions I outline in the Introduction chapter above.

Finally, in the Conclusion of this thesis, I summarize what I have found in this thesis and the relationship that exists between the physical and the digital.

2. Theory

2.1. Conceptualizing communities

Live chat user 1: "we got another one falling down the rabbit hole!"

Community is a notion notoriously difficult to define and explain. They can echo Putnam's (2020) focus on the meeting point between social capital and individual interaction, and the decline of American participation in formal organizations associated with that text, or Jacobs's (1993) focus on the neighborhood as itself a defining characteristic of communities and how the spatial form of these neighborhoods affect how relationships are formed and maintained. Likewise, it can also be contextualized in terms of explicitly social terms, like the members of the Hololive Myth community do when calling on images of Alice 'falling down the rabbit hole' into Wonderland or Neo's growing understanding of the Matrix, a reminder of how commonplace some cultural references are, a suggestion of the confusing language and odd rituals that the uninitiated might encounter, and an indication of what those in the community expect of newcomers. Considering both of these extremes, we might find some middle ground in Tönnies's (2001: 19) suggested relationship between 'community', *Gemeinschaft*, and 'society', *Gesellschaft*:

> *"Community means genuine, enduring life together, whereas Society is a transient and superficial thing. Thus Gemeinschaft must be understood as a living organism in its own right, while Gesellschaft is a mechanical aggregate and artefact."*

Christenson (1984: 162) has proposed, following König, that the simple translation of *Gemeinschaft* into community does the intended meaning that Tönnies might have suggested a disservice, that "While Gemeinschaft usually is translated to mean "community," Toennies [*sic*] seems to emphasize communal spirit or communal relationship rather than the spatial dimension. Gemeinschaft is a form of communing." Bond (2011), in outlining Tönnies theoretical relationship with Hobbesian rational thought, has put forward that, while *Gemeinschaft* is commonly attributed to mean 'community' and *Gesellschaft* as meaning 'society', we might be better served in understanding that Hobbes and Locke made little difference between 'commonwealth', 'community', 'civitas', and 'society'. Tönnies creation of a dichotomic relationship between *Gemeinschaft*/*Gesellschaft* is, in this critique, a simplification born out of Tönnies belief "in the precision of language and its ability to render discerningly vast complexes of diverse ideas" (Bond, 2011: 1191). Keeping this in mind, I will use 'community' and 'society' in line with previous scholarship.

This understanding does not inherently sidestep the assumption that community is commonly understood as physical proximity, but we might do so by emphasizing the 'we-feeling' that is formed within a group as part of how it communes (Beckwith, 2019). This we-feeling suggests that we should emphasize the importance of social con-

nections when trying to understand what community is, where emphasis is on shared interests, occupations, or goals rather than proximity. This is particularly relevant for us if we consider the contemporary assumption that digital technologies reduce the distances between individuals—not in terms of physical distance (the invention of the airplane has done that much more effectively than a computer), but instead by transforming temporal restrictions affecting social interaction over large distances into (mostly) a non-issue and by assuming access to the necessary hardware, software, and underlying infrastructure to communicate. While changing the socio-temporal proximity of communication is not limited to computers: shouting, postal mail, semaphore, telegraphs, telephones, and fax machines, among other inventions, have all contributed to this minimization of socio-temporal proximity, they are limited in their potential for community-building (as opposed to community maintenance) thanks to the inherent limitations on how many active participants can interact simultaneously. What the computer-mediated communications (CMC) of the 'Web 2.0' (i.e. Herring, 2019) allows for is to retain the nearness of community in spite of real or perceived physical remoteness by developing digital geographies within which individuals can commune with one another.[1]

Also pertinent is that we find some alignment in this understanding when compared with how 'fan culture' and 'fan community' tend to be framed, but also demand that we address how the loss of geographical proximity might complicate how communities perceive their membership. While one can alienate a neighbor socially, they are still a neighbor and a part of the community by definition of their proximity despite their place at its social periphery. Framing a community in an entirely social context, as we might with a 'fan community', instead forces us to approach communities through either self-described membership, by who pays or does not pay for membership, or by relying on the definition of membership given by a community's members. The latter definition, either by accident or not, might question or ostracize certain 'interpretive communities' and as such lead us to ignore the depth of involvement of those defined as 'non-members' (Hills, 2017). This certainly seems evident in the multiplicity of fans that appear in online contexts, where various states of misalignment within a broader conception of community or culture can occur as various participants are too marginal, too casual, or simply do not use certain platforms where the formation of community takes place, something which certainly questions conceptions of online community as inherently tied to a specific platform (cf. Iriberri & Leroy, 2009).[2] Hills (2017) has instead proposed that fan communities occupy a 'fan world', which is to say that a fan's interactions with their community take place within a network of different discourses

[1] However, it should also be acknowledged, as O'Reilly (2012) has done, that 'Web 2.0' is often used to create materials that "combine [...] buzzwords to create meaningless, but convincing, marketing materials for a hypothetical Web 2.0 site" (O'Reilly in Mandiberg, 2012: 4) and, as such, has less to do with how individuals actually use or understand these platforms than how they are presented to potential customers.

[2] This should not detract from the usefulness of the online community life cycle framework that Iriberri and Leroy (2009) have suggested—Halupka (2017) has for instance shown its usefulness in cataloguing the online organization Anonymous over the span of years. This framework will not be used in this thesis, however, because of the short amount of time that the communities were studied for, a period that might be described as in between the 'growth' and 'maturity' phases that they have outlined. However, there might be potential in adapting their model for understanding how communities make use of different platforms in order to fulfill communal needs and how this might spur digital migrations of communities.

and platforms that are unique to every individual, which is a useful position to take when the field being studied is inherently multi-communal and multi-platform.

Benedict Anderson's (2016) suggestion that the creation of national communities are in part a result of 'imagined communities' can likewise be drawn on—as Agostini and Mechant (2019) have—in emphasizing that communities are made up of a set of norms that individuals ascribe to, in part or in full, in order for interactions to function. Likewise, they point out how 'the real' is always in itself virtual as a subjective construction, while the virtual is real when absorbed in the technology that delivers it. This 'perpetual contact' is made possible by the distribution of shared symbols that allow for the existence of both an individual and a collective relationship to and understanding of one's position within the greater whole, or as in opposition to other imagined communities by way of 'print capitalism' (Anderson, 2016). Indeed, Storey (2012) has noted that the relationship between nation and state can be seen as the relationship between an understood culture and its related political institutions, respectively. The use of print as a metaphor can further be used to understand how landscapes are themselves understood, as with Scott's (1998) view that nations—or rather the bureaucrats, politicians, and so on who govern the state that is associated with the nation—perceive their territories administratively rather than as physical landscapes, an act which seems equally applicable even to other communities who retain (and reform) their identities over time through the consumption and interpretation of online symbols.

While the language of reports, memos, presentations, etc. are clearly applicable to states and nations, digital communities can equally be understood through the textual landscapes that they are made up of, albeit not with the intention of exploiting resources in the same way as a state. Indeed, if the development of print simplified the communication of these shared symbols of nationhood, distributing and homogenizing them in order to reinforce their legitimacy within the communities that could access and parse their meanings, then it should no doubt have been made even simpler in the context the various languages of digital milieus (Shifman, 2011). This distribution of cultural content in the digital can be done virally, which is to say as a simple republishing of already existing content, or memetically, where the original content is recreated with "a wide range of communicative intentions" ranging "from naïve copying to scornful imitation" (Shifman, 2011: 190). This shift in form of distribution carries with it a fundamental change in how one identifies with a community thanks in part to the merging of identities between those who consume and those who create the symbols that establish these identities, echoing Hartley's (2004) proposed shift from a 'read-based' to a 'read and write-based' society. Just as in physical space, communities are not formed by being ordered to exist—that would be less a community and more a hierarchy—instead, communities are formed through the mutual exchange of ideas and through the derivation of shared information, the result being the forging and reforging of identities within and as a group.

2.2. Digital geographies, digital divides, and digital beings

Ash et al. (2018b) have argued, in their overview of the so-called 'digital turn', that digital geographies can generally be understood as being produced in three ways.

First, geographies can be produced 'through' the digital, something most easily understood in how geographic information systems (GIS) are used to produce geographical understandings, alongside other technological and methodological innovations. Second, geographies can be produced 'by' the digital, which create spatial differences between groups thanks largely to where digital infrastructure is installed, and equally where it is not. The 'digital divide' can further be complicated in the technologies that are used and how allow for both the creation of previously impossible connections and transform identities previously rooted only in the physical landscape. Finally, geographies can be produced 'of' the digital, making the claim that the digital should be approached as a material realm in its own right, emphasizing the 'space' in cyberspace. Even here we see the echoes of the digital divide, although in the production of big data rather than in infrastructural access, but we also see a uniquely digital form of mediation in the form of data access being decided by algorithmic—rather than, for instance, economic, cultural, or cultural, for instance—power dynamics.

It is this third form of producing the digital that perhaps aligns most with questions posed in this thesis. However, it must be noted that while having such clearly delineated objects of study is useful in understanding the world, it simultaneously runs the risk of reinforcing an artificial divide between ways of experiencing the constituent parts of a cohesive digital geographic landscape. The point Felgenhauer and Gäbler (2018) have made seems reasonable in this regard: one cannot interact with what is produced by the digital if one does not simultaneously interact with what is produced through or of the digital. While Ash et al. (2018b) have contended that while one can approach a monolithic 'digital geography', more meaning might be found in viewing digital geographies as many geographies that both affect and are impacted by the physical landscape, as well as contains many different geographies.

Only a minimum of the infrastructure needed to make the internet 'just be there' is in actuality 'just there' (Felgenhauer & Gäbler, 2018), rather it envelops the physical landscape in the form of broadband cables, electrical lines, server hubs, and so on. But that which is 'just there' contributes to an increasing erasure of difference between individual perception of 'the real', which is to say physical geographies, and mediated digital geographies, what Virilio has called 'cybernetics'—the increasing speed with which data flows outmatches even the immediacy of our embodied humanness, that the use of (and subsequent integration with) technologies is already rendering embodied experience unnecessary, and that self-experiential identity will be lost because of it being delivered and mediated through the light of pixels shining into our eyes (Montuoro & Robertson, 2018). Following Baudrillard, they have suggested that identity becomes a suit we can slip on when entering our life on the screen: it does not require us to *be* us.

The practice of 'multiple profile maintenance'—that is, an individual using multiple account identities on one or across several platforms—or the adoption of 'throwaway accounts' in order to juggle multiple identities and levels of anonymity by tailoring the information each account can expose as proof of this claim (Hogan, 2012; Leavitt, 2015), but it simultaneously forces us to ask why the original account is so important as to be saved from being exposed. There is a history associated with a username despite its anonymity: a history of viewership, associations, observations, comments, and

thoughts that are posted in its name, just as real as the references in this text or, indeed, the anonymous faces we meet on a street, perhaps exemplified in the social pressure for self-presentation by either free or even paid-for decorative items that are otherwise materially irrelevant in their digital form (Kim et al., 2012). Likewise, disregarding the identities associated with these profiles ignores the 'material affect' of screens themselves (Ash, 2009). When taken together, unintentionally or not, the thought that identities in the digital are worth less than identities in 'real life' also suggests to us, perhaps incorrectly, that misrepresentation is inherently more common in digital space than in physical space (Eynon et al., 2017).

Ensslin and Muse (2011: 3) have used the term 'Second Lives' to denote the "alternative identities and behaviors [that] are enacted and negotiated in a wide range of virtual ontologies" and, in so doing, evoke the promise of living in 'virtual worlds' that the eponymous *Second Life* (Linden Research, Inc., 2003-2021), for example, once suggested we could do. However, this use of the term inherently makes the act of engaging with the digital as something exceptional, which seems to be the case less and less in its use for both work and play. While we might think of this as being glued to a screen, doing so ignores the intermittent jumps between the digital and physical that have become commonplace as we use a map application to find somewhere to eat or to allow us to ignore the world around us and suggests an inherent spatial differences in engaging with entertainment provided by video games and the geographic utility that applications provide. In this sense, the movement between digital and physical can be seen in terms of space being 'more or less digital', where the impact of the screen itself can be of greater or lesser importance at different moments in time (Merrill et al., 2020). Nonetheless, the connection between digital communities and video games is perhaps deeper than one might initially believe both as active forms of entertainment—that is, actually playing the game with controller or mouse and keyboard in hand, or on desk—and as a more passive form of entertainment—watching someone else play the game in front of you, either while in the room[3] or, perhaps more commonly nowadays, through the screen on which one watches live streams.

2.3. Atmospheres and thinking through community

Sumartojo and Pink (2019) have suggested that the study of 'atmospheres' can provide a framework for understanding both the representation and experience of space based in both individual foreknowledge and expectations that then merge together with other individual's expectation to create an experience that is beyond representation and difficult to describe, and yet mutually agreed upon within a space and time. They have argued that atmospheres are most easily made useful by approaching them using three analytical orientations: knowing 'in' ,'about', and 'through' atmospheres.

Knowing in atmospheres deals with how one is a part of the unspoken, non-representational, and affective dimensions that are both specific to a single experience of

[3] A common experience when I was growing up, if someone was bad at a video game. When the character being controlled died, the player who had controlled that character had to pass the controller to the next person. The custom among my friends was that those playing would sit on the couch, and that the loser(s) would sit on the floor.

place while also being mindful of the "entanglement with everything else that people might be doing, feeling, sensing or thinking when encountering a place of event" (Sumartojo & Pink, 2019: 39). This way of knowing atmospheres intersects with self-reflexivity, which is something I'll return to in more detail in the Methodology chapter, but also constitutes an attempt to create a personal understanding of the atmosphere in question. This has been echoed in Sumartojo et al.'s (2019) study of urban illumination as visual atmospheres that isolate the mind as a visual perceiver of its surrounding spectacle. In the digital, this light is carried on the pixels of a computer screen rather than from the lights that appear in physical terrain and/or as a bubble created by sound waves, in themselves dependent on how the content[4] is eventually consumed: I can listen to the audio from multiple places at once, mute a video and only watch it, use different speakers to listen to different things from different directions, change to what extent my surroundings are allowed to seep in, speed up or slow down the content from its original speed—to name but a few possibilities—and then how these choices are subsequently affected and filtered by individual perceptions and abilities.

Knowing about atmospheres means to extend this understanding by also encountering the perceptions of others in order to not just observe, but to gain a deeper understanding of an atmosphere's inherently amorphous character as a multiplicity of experiences and memories. Despite being difficult to capture, atmospheres still need to be defined and described so that they become useful as a research tool and are able to be communicated in a way that they become understood. The authors have intended this as both a part of the researcher's duty to clearly express the content they are researching, but also as a method of gathering material to access those same experiences and memories as documents of a specific time and place. Finally, knowing through atmospheres means understanding the atmosphere as a concept rather than as an object: they are emergent creations that exist in relation to other spatial phenomena that are constantly in a state of becoming. The authors have proposed that atmospheres should be thought of politically "because encounter is one of the chief animators of atmosphere—and in any encounter there are differentials of power" (Sumartojo & Pink, 2019: 44) which further suggests an ethical dimension of how atmospheres might be affected by the act of researching them, a thought that I will return to in the next section.

Taken together, as Sumartojo and Pink have suggested we should, to know in an atmosphere—that is understanding that every individual's experience is different and impact all other participants by their actions and thus the perceptions of atmosphere that exists within it—must mean that we should know about or through given that they are all part of the same whole. Perceiving atmospheres as 'vagueness in the right way' (Griffero, 2014) stands in contrast to another use of atmospheres as something inherent to structures and, as such, designable (i.e. Böhme, 1993, 2013). This is not to say that atmosphere cannot be formed as a result of changes made to physical space: Griffero (2014: 2) has noted "that to paint the walls means to essentially change the at-

[4] There does exist some contention with the term 'content' when referring to items that are digitally produced since it can (un)intentionally minimize the labor involved in the creative process, and in its contested use in terms of 'user-generated content' (i.e. Anderson, 2012; Mandiberg, 2012). I use the term here in order to broadly refer to products, whether physical or immaterial, that have been created and made available for public consumption.

mosphere of the room", but that this change is not the same for every person encountering it: painting a room red might make it seem (in grossly simplified terms) cozy to one person, aggressive to another, lucky to a third, and so on. They are inherently subjective, nuanced by how and where our senses make contact with whatever atmospheric markers exist and what they allow us to perceive.

Atmospheres in digital geographies are slightly more difficult to grasp given the gulf between the auditory/ocular and the gustatory/olfactory/somatic: the former allowing similar—but not the same!—experiences of a shared digital space. For instance, while we might watch the same film in our respective homes, our peripheral ocular experiences would be linked to the room we are in; and if we were to listen using the same type of headphones, the soundscape of the film would still be littered with the sounds of our homes. Likewise, the conceptualization that our sensory worlds are divided into five senses can itself be problematic, built as it is on the assumption that humanity's sensorial experiences are, always have been, and always will be the same (i.e. Smith, 2007).[5]

Moving beyond the five senses, Montero (2007, 2018) has written about the sensory experience and the aesthetic possibilities of proprioception, which is to say the sense of how one's body is positioned in three-dimensional space, in terms of dance, but these considerations might be usefully extended to the experience of both physical and digital place and space.[6] Indeed, it is a suggestion that there are many more senses available to us than we are conditioned to think in terms of, and that our perception of these senses can be developed depending on how we learn to use them.

While we could instead speak in terms of bodies and rhythm, as with the ambulatory body's dialectic relationship with space and place if we follow Lefebvre (1991, 2017) or the body as 'emplaced' in a specific socio-cultural and normative space connected to the performance of a role in place Pink (2011) has described, proprioceptive experience is more minute: not the body's movements, but the positioning of the body's parts. All three are doubtlessly applicable in different ways—for what is proprioception without considering the body's emplacement or the rhythms of many bodies at once?—but are useful in describing different things. The development of virtual reality[7] has, for example, brought us much closer to sharing more dynamic proprioceptive experiences given the requirements for correct bodily positioning when consuming it as media, but we already experience something similar when using a mouse, trackpad, touchscreen, or keyboard to navigate, or let our eyes flick over the contents of websites we visit and the computer programs we use. The 'frictions' we experience in the interfaces of the digital landscapes we traverse are mutual experiences insofar as they require facsimiles of the

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[5] Hosokawa (1984) has suggested that this sensorial disconnect can be seen in terms of the walkman as well as a social disconnect between the 'walkman-listeners', who seek the 'autonomy' these new spaces provide, and Umberto Eco's 'cultural moralists' that will not—or cannot—understand the changes that are taking place. It should, of course, be noted that the object of interest for Hosokawa was the use of the walkman as a creation of one's own space within a broader space, whereas I am more interested in the ways that these spaces interact with each other.

[6] See Lagopoulos (2019) for an overview of the historical development of scientific and cultural strands of proprioceptive thought and the varied perceptions of bodily positioning.

[7] For a brief historical overview of the development of virtual reality as a technology, I refer to Lowood (n.d.).

same movements, despite the fact that the content we might see are different (Ash et al., 2018a). In a very general way, and being unreasonably dismissive of differences in languages, we always read the same book when viewed through a proprioceptive lens. While the digital separates us proximally, it unites us in the immersion[8] of proprioceptive sensorial feeling as we type, click, and look. Digital geographies are not merely geographies of digital technologies or the code constructed from combinations of digits, but also geographies of human digits and their positions.

Of course, there are risks with approaching the creation of space through the lens of proprioception. Most obviously is that it reinforces ableist conceptions of place use by erroneously suggesting that not using one's hands when using the internet means that one cannot experience digital atmospheres, and equally risks implying that the various different poses one can adopt—such as standing, sitting, lying down, etc.—or the motions that can be used to interact—such as clicking, swiping, looking, or thinking—given the many different forms of computer hardware. Another risk is that it is taken as an argument that the feeling of using a body is necessary to experience an atmosphere. I do not suggest either of these positions, intending instead for proprioception to be a way to complement the understanding of atmospheres by acknowledging the way that the experience of one's body might, or might not, impact the way that digital spaces are experienced physically.

2.3.1. Algorithmic becoming of community

When applied to digital geographies, atmospheres provide us with a framework to understand how individual understandings in combination with each other create a feeling of community through the content that is created—an interaction between what is viewed, what is communicated, how it is presented, and so on. Simultaneously, issues can arise from considering the digital as geographies, in particular that one might default to thinking about spatiality in physical terms rather than in digital ones. Li et al. (2010) have suggested that the boundary between the synthetic and the real is porous, allowing for the exchange of rules, ideas, and beliefs between 'measured' space—which is to say abstract, uniformly segmented, grid-like—and 'lived' space—that is filled with tangible objects and variation. The difference is not one of content, but of the form it takes; and while these ideas are contextualized in terms of online video games, the observation seems equally applicable to other interactive, online spaces. Indeed, in the decade between their paper and this text, 'crossing the boundary' between these spaces has become a commonplace occurrence.

Elden (2013) has suggested that the experience of 'boundedness' can lead us to ask how we define what space is and, by doing so, how our definitions of space hide or reveal various power dynamics. Indeed, by focusing on the 'surface' of territories, we ignore spatial 'volume'; by ignoring their volume, we in turn ignore the inherent three-dimensionality of spaces and consequently describe them as simple, two-dimensional constructs. Digital data tends to be experienced at its point of contact with the individ-

[8] The term 'immersion' is one used as a vague measure of how media, in particular video games, involve individuals in the ludic and narrative spaces they create that can be applicable to experiencing atmospheres (i.e. Michailidis et al. 2018; Shin, 2018).

ual, but it is rendered as a volume: physically through fiberoptic cables or WiFi signals that are either underground or hang in the air, or perceived as part of a 'cloud'. These verticalities are not always visible. They exist all around us, but tend to only be experienced through the immediacy of the devices that subsequently 'display' them: the signal strength of a SIM card on a mobile phone, the blinking light of a WiFi router, or the time it takes to buffer a YouTube video. They indicate the existence of data beyond the immediate device that—while undeniably a product of an infrastructural volume—is not necessarily or immediately intuitive given the existence of a whole industry with an interest in minimizing the encounter with technology so as to make the *experience* of technology seamless (A. Taylor, 2018).

All this is meant to point out that social connections made online are not governed solely by the confluence of choices made by individuals. Instead, the data contained within communication overlays and overlaps algorithmic decisions with individual choice, meaning that algorithmic access is defined with and by our previous activities and values. This 'algorithmic governance' (Zook & Blankenship, 2018) creates digital geographies that can vary wildly in content between individuals since algorithms create different atmospheric spatialities, temporalities, and movements of the digital in accordance with predetermined rules. As König (2019: 470) has noted, algorithmic decision-making can be incredibly detailed conforming to individual behaviors

> *"like a blanket that takes on the form of an uneven surface on which it is placed. The more this blanket solidifies […] the more its texture of micro-rules turns into a sort of casting mold that may guide or constrict individuals' behaviors."*

The genius is that individuals are steered without needing compulsion since the algorithm maintains the social parameters individuals have unconsciously created for themselves. The selective parameters are largely intended to entice a user to consume more of whatever the platform is selling (Buf & Ștefăniță, 2020): explicitly in the form of funds changing hands, implicitly in the form of bartering access to personal data, or a combination thereof.

The state of 'becoming' that Sumartojo and Pink (2019) have suggested, rather than the static 'being', might be of particular interest when viewed alongside Deleuze and Guattari's conception of 'desire lines', and how lines and the wake they create can help us understand how movement in digital landscapes interacts with the algorithmic blanket (Windsor, 2015). 'Molar lines' are those pathways prescribed to us in rigid form, 'molecular lines' are pathways that are less determinable that the molar build upon and make rigid, and 'lines of flight' are those paths that take us in a fit of passion away from what we've earlier deemed possible. But rather than being led along "those spontaneous pathways that break away from the prescribed routes restricting mobility" (*ibid.*, 2015: 157) as one would in the physical world, we are instead presented with simulacra of spontaneity: the choice to click (and remain on the platform) is ours, but the choice of pathways is instead curated according to the sum of our previous selections according to the data gathered about us.

This is not to imply that all algorithms are created equal or even that all digital geographies are affected by their algorithms equally—though Pasquale (2015) might suggest we ask how much that matters so long as we do not know how they make their decisions, what data they use, to what end their decisions are made, and what we should do to change this informational asymmetry. But using YouTube as our example, we can see that—as with any other piece of technology and despite the obfuscation of its methods because of the contemporary need of corporate trade secrecy (Vaidhyanathan, 2012)—the algorithm is not so hidden as to be impossible to take advantage of by those with a mind to 'exploit' the imperfections of its parameters in order to affect a change in what the algorithm presents (i.e. Bridle, 2017; The Spiffing Brit, 2021a, 2021b). It stands to reason, then, that despite us being surrounded and informed by the algorithm in ways that are difficult for us to quantify, the algorithm can still be taken advantage of by those who figure out its tendencies. While unquestionably imperfect both in terms of accessible information and as a comparison, this making-visible and subsequent wrangling of the algorithm does seem to echo "the mix of opposition, unity, and contradiction which defines the social-spatial dialectic" (Soja, 1980: 208) that might otherwise be ignored if we only see the algorithm as outside of our grasp.

2.4. Geographies of digital consumption

2.4.1. Geographic understanding through narratology and ludology

While this text is not a study of media or video games *per se*, they are a cornerstone of what has popularized the modern iteration of live streaming and the communal landscape in which this specific case takes place both in the form of specific game(s) being watched/played during a particular stream, and in how these games are positioned in a broader collective understand of what type of person plays certain games (T. Taylor, 2018). While a certain game can certainly be what draws an audience in—acting much like a shop window trying to capture the interest of a passing public and entice them to enter and consume—it does not explain why these same individuals participate in live streams without any game being played, or apologize for missing earlier live streams. This can create something of a dilemma, since I think it is important to avoid contextualizing this inquiry as a study of what can broadly be labeled as 'game/gaming culture'. While it is a term that can be useful, it must be remembered that 'gamer' identifies both those who play video games and those who identify themselves in gaming as a subgroup, with all the complex internal and external contestations of identity and belonging that implies (Ćwil & Howe, 2020). All that said, the literature on video games might provide us with a fruitful avenue for understanding how digital landscapes are used. Jones and Osborne (2021) have observed that there exists two ways of studying video games: 'ludology' and 'narratology'.

'Ludology' focuses on the act of playing the game itself—in other words a facsimile of the physical experience when interacting with place—whereas narratology focuses instead on the storylines of the games in question—which focuses on the creation of spaces (cf. Lefebvre, 1991). Indeed, it is not only video games in which "[a]ction, agency, and temporal saliency define video games apart from film, literature, or visual

arts" (Anderson, 2013: 293), but also other forms of modern non-linear media (T. Taylor, 2018). This ludology of communal digital geographies can be seen as something instrumental, a way of driving and retaining website traffic by engaging users in a way as developers of a platform might: as a series of functions and events in order to increase interaction and retention, convincing users to not merely take a look at what a platform offers, but also return to it (Kim, 2000). Koh et al. (2007) have suggested that it is through technological innovation that virtual communities can overcome the unique challenges of spatial dispersion between its participants. This, in turn, suggests that the way forward in creating sustainable online communities is to focus on the ways that interactions are mediated by technological choices, a thought echoed in the 'affective design' of digital media (Ash, 2012). While a useful way to approach online communities, it might simultaneously imply that participatory limits are solely technological, and further suggests both that only the offline can inform the online without being affected in turn, and that the rate of population growth in a community is the best measure of its health.

The other form of knowing the digital, as defined by Jones and Osborne (2020), is 'narratology'. As the term might suggest, narratology looks at how spaces are created narratively in the context of video games and how the world within the game is defined in the same way. In part, this reflects the earlier contextualization of textual geographies and shared symbols as the building blocks of landscapes, proposing that it is these narratives themselves that make up the perception of the landscape. While this applies to the video games as they are played—with internal narratives spanning from the superficial to the complex—they also apply to how interactions are contextualized in the social space of a live stream, what knowledge becomes a necessary part of community membership, and who might (not) be understood as being able to add to the narrative. Certainly, Thon's (2017) observation about the possibilities for narrative are subject to the 'media specificity' through which a story is told; much like we would not (or would take exceptional care when we) apply locally specific geographic theory to another location without reflection, we should also be careful when applying narratological practices learned through one medium onto another (Ricksand, 2020).[9] Anderson (2013) has proposed that, beyond the ludological and narratological (the latter referred to as 'communicative') discourse surrounding video game research, there also exists a 'transitional' mode which seeks to explore the 'foggy' spaces between ludology and narratology. This aspect is especially interesting since it indicates that these terms are not static opposites and lie instead on a spectrum that suggests that we can view ludology and narratology through ludic and narrative lenses.

2.4.2. The infra-ordinary in the society of the spectacle

The connection between ludology as a descriptor of 'place' and narratology as a descriptor of 'space' also indicates that they are not inherently separate from each other

[9] This is not to say that one should not apply knowledge beyond its original scope, nor that one should retreat into idiom and claim that the 'more things change, the more they stay the same', but to note that critique is equally applicable to the theories and methods used as to where they come from and why they are applied in a specific context.

while also providing us with a way of understanding movement where we lack the experience of a sensing body (assuming a body that is fully able): smell, touch, and taste become cut off in a world that is experienced sensorially through sight and sound. I agree with Ash (2009) about the affective materiality of images—that the display of images can affect the individual physiologically, existentially, and sensorially through the striking of light upon skin—but taken on its own it ignores that you and I do not have the same total sensorial experience when viewing a video on YouTube when in our respective neighborhoods, homes, and rooms. It is, as such, useful for us to look at both how the interaction with technical decisions made to create digital landscapes affect the organization of its users as well as the narrative constructions that bind them together, allowing us to potentially observe the 'infra-ordinary'[10] (Hung, 2016; Perec, 2008; Sturrock, 2008); the overlooked, everyday use of space so often hidden by the spectacle: the way our shopping sits at our feet when in line at the cash register, how we cast our eyes when stepping onto the white (or the black, or the 'Look Left', or the lack…) of a crosswalk, our fingers dancing over a keyboard quickly composing a retort to a friend.

Of course, one can say that everything eventually becomes the spectacle by virtue of the commodification of all the spaces we inhabit by depicting "what society could deliver, but in so doing it rigidly separates what is possible from what is permitted" (Debord, 2006: 14). This text you are reading now is itself, unavoidably, a commodification: theoretically, as being a way of knowing, and concretely, as it creates a physical separation between writer and reader. But where Debord considered the separation created by the automobile, radio, and television—items inherently linear in their production, or perhaps more correctly their depiction, of space—we instead approach the internet, the possibilities and permissions that it creates for us, and the ways its spectacle drives us apart as well as together. If we judge the spectacular as part of, rather than separate from the infra-ordinary (or the infra-ordinary as part of the spectacle), then we might find that the spectacle that appears on our screens in the pixel's flash hides infra-ordinary relationships in the shadows formed from this light. While the anecdotes of individuals so engrossed with playing *Pokémon Go* (Niantic et al., 2016-2021) that they fall off a cliff or ignore seeking medical attention after being stabbed are spectacular (Montuoro & Robertson, 2018), it is itself the spectacle that drives us to thinking that we are closer to others when in actuality they separate us from lived human-ness by the commodification of actions dividing us from each other (Debord, 2006; Trier, 2007).

[10] I will use 'infra-ordinary' in this text following Spurrock's translation, but should note that it has also been rendered as 'infraordinary', for instance by Hung (2016). I find that the latter translation, with the dash ignored, makes the ordinary seem like an afterthought, whereas the dash in the former translation seems to heighten the fact that it is still ordinary despite being infra'ed, so to speak.

3. Methodology and Method

3.1. Fields, or marshes, of study

Fielding et al. (2017) have suggested that while the metaphor of the 'field' is an oft-used and useful term, it can also be seen as something of an anachronism when it comes to online research, that often seems more akin to a 'river' where data streams past. Rather than reaping information that has grown within a clearly demarcated area, as one would in pastoral agriculture, one must instead capture it as it passes by from its source to where it empties into a sea of other information. This can be the case, especially in regards to explicitly unarchived data creation or the sheer mass of data that can exist, but can also have the unintended effect of emphasizing the impermanence of data which can be especially problematic since many digital landscapes become archival landscapes that can just as easily be traversed after they are created, albeit with a potential loss of full interactivity (i.e. Fortun et al., 2017). Understanding this leads us to consider the need to define where the data will be gathered, a decision that in turn implies that the collected data only show a partial truth further complicated by the fact that data are not necessarily 'gathered', but instead a series of interpretations of phenomena that are themselves inherently subjective (Flick, 2018). This simultaneous representation of informational deluge and unending archive can for example be found on YouTube, a platform upon which users upload around 500 hours of video every hour to an already huge collection of video at the time of writing (Wojcicki, 2020). Perhaps, rather than speaking in terms of fields and rivers, we should—finding naïve solace in other metaphors of physical landscapes—consider the study of (digital) geographies as a study of marshlands: watersheds teeming with life, buffeted by the ecosystems they are situated next to, while affecting these same places in turn. Indeed, this metaphor allows us to go beyond the one-dimensionality that other ecosystems might suggest to us, such as the placid harvest of knowledge from a field or the unstoppable and unidirectional flow of a running river, and thus allow us to consider the inherent heterogeneity of volumetric spaces.

In particular, I will turn my attention to the digital communities associated with the Hololive network of virtual idols that primarily appear on their YouTube channels, specifically the Hololive English network that can be referred to as 'Hololive EN' and is also known by the group name 'Hololive Myth', which can often be rendered as 'HoloMyth'. I will use 'HoloMyth' going forward since it specifically refers to the group and communities I observe while retaining a constant reminder that the group is connected to the rest of the Hololive network, since 'Hololive EN' technically refers to the English-language network as a whole. Hololive Production is an entertainment network including Japanese and Indonesian language networks that is owned by COVER Corp., a Japanese entertainment company. A parallel network to Hololive, called Holostars, also exists that only has male-presenting personalities. This, in turn, makes for something of a contrast from other live streamers who tend to work independently rather than as part of a corporate entity and thus contrasts itself as not only an organic community formation, but more clearly shows the potential struggles between a board-

room and how people actually interact with a space or in a community (cf. T. Taylor, 2018). This case also approaches the multiple layers of digital interaction that take place within a single fan community, between different communities that are explicitly connected, and what might be considered as a broader, inclusively multilingual community that seems uniquely digital in nature.[11]

3.2. Spaces and places of YouTube live streaming

The selection of HoloMyth as the object of study was one of algorithmic happenstance. It was brought to my attention thanks to my interest in rap music and my intermittent consumption of reaction videos[12], leading to Mori Calliope's song 'Excuse My Rudeness, But Could You Please RIP?'[13] appearing in my YouTube Recommendations just days before I was to start writing this thesis. The subsequent appearance of related video clips in my Recommendations list heightened my interest, not least the number of translated videos which suggested the potential to study the creation of community in spite of my own limited knowledge of languages other than English or Swedish. Selecting YouTube as the primary location for community interaction means that the majority of the observation is carried out as a part of YouTube's Live streaming service, which takes place on the same platform as other YouTube videos but in a slightly different format.

Given the relatively little use of YouTube as a streaming service as compared to other platforms like Amazon's Twitch.tv (T. Taylor, 2018), and the lack of research focus it has received until now, a quick history might be in order. YouTube Live began testing in 2009 and was integrated as the YouTube Live platform in 2011 (BBC, 2010; Gross, 2010; Siegel & Hamilton, 2011). At first, access was limited to selected partners and events, but was later made available to more of the platform's users in 2013 with various changes being made to the automated parameters used to judge which users could use the feature (Franzen, 2013; Pierce, 2015). At time of writing, YouTube (as much else on the internet) is still being developed and undergoing change. For our purposes, that which holds the greatest interest are the changes being made to how the algorithm handles inputs (i.e. The Spiffing Brit, 2020a, 2020b) and how interactions between viewers and viewed can be mediated (i.e. MacDonald, 2017; Wright, 2020). These types of changes reveal something that is both similar to and different from the negotiation of space in the physical world: where the physical world contains things be-

[11] The term is imperfect since it *de facto* assumes that other linguistic communities are inherently exclusive in nature. While it is true in the sense that it is more difficult to join in more advanced conversation with no shared language, this does not mean a lack of non-verbal communication or that there exists an inherent distrust of outsiders. Speaking from personal experience, many excellent conversations can be had in spite of, or even because of, mutual misunderstandings because of an acceptance that mistakes will be made which, rather than build resentment, are used as tools to build camaraderie.

[12] Reaction videos are a style of spontaneous media review—of memes, music, film, lectures, etc.—that often, though not always, presume that the creator(s) has not seen or heard the media beforehand. These can be accompanied by more detailed breakdowns of what makes the media in question good or bad, especially if the creator or creators are experts in some capacity, or can simply be a spontaneous take by an amateur. At time of writing available at: https://www.youtube.com/watch?v=haBSofDkamM.

[13] The video is at time of writing available at: https://www.youtube.com/watch?v=5y3xh8gs24c.

yond direct human control, such as the many ecosystems, and can that can be changed by official and unofficial interactions with it, the digital world is a human construct, and is often corporately owned. The experience of the digital is mediated through a programmer's decisions of what is allowed to happen and what regulatory frameworks they need to follow. Using the metaphor of ecosystems, a physical ecosystem can be understood, but cannot necessarily be controlled, whereas a digital ecosystem is both knowable and controllable through the code that it is constructed out of. This suggests that it is becoming all the more important to understand code in order to understand the world around us while also implying the ways that many of our daily interactions take place in ways beyond our understanding and control, and are hidden on the other side of the opaque barrier of a trade secret.

Despite the selection of YouTube as the place of observation being a seemingly simple answer to a simple question, it belies the complexities of communication in digital geographies, the multiplicity of landscapes a single conversation might take place in, and the difficulty of selecting a single platform as the only platform where this community congregates. Much like in the physical world, communities have multiple sites where they might interact, each one providing subtle differences in what communication is or is not engaged in. So while YouTube is the primary place where this study takes place, just as much engagement might be found through interactions on other platforms and through other mediums than video, such as in music, through artwork and comics, and text in the form of fan-fiction. While I did allow myself forays into these other landscapes, I gave primacy to YouTube with the reasoning that it was on this platform that the immediacy of community was best represented and seemed to find a place to sprout from.

YouTube as a landscape is ostensibly navigated as a collection of Channels, a term with a slightly different meaning when compared to the channels found on a TV. A Channel on YouTube is more closely related to the concept of a profile or account found on other platforms which gathers the content created by a Content Creator, the platform's term for users that create and post videos. These accounts can be linked to a broader Google account that allows for access to other Google functions, but these are not necessary to use for the YouTube account to function. While most videos posted on YouTube are uploaded, a Live Stream is a type of video that is recorded live from the creator's device—the streamer most often being the owner of the account—or from a selected window on their screen, that audience members can watch in (near) real time. During a live stream, there is a Text Chat where viewers can write messages that are added in real time and which makes up the interactive communication during a live stream. This chat is visible to both audience and performer, of course, and creates the direct dialog between audience and performer—a dialog that is of primary interest in this thesis. Some messages take the form of Super Chats, paid messages that are highlighted and are often accompanied by on-screen notifications that inform the other viewers who have donated money. After the live stream has finished, Comments can be added underneath the video (unless they have been deactivated by the uploader) which are public as well.

There are also Community posts that are public messages similar to Posts found on a platform like Facebook that can be shared by a creator that display information as text, photo, survey polls, or a combination thereof. These Community posts are, at time of writing, an interesting phenomenon in that they are more prevalent on the mobile version of YouTube (i.e. the version that is used on a smartphone) than the version available on a web browser. This is especially interesting given that while digital geographies are inherently mediated, it indicates that they are not always mediated in the same way depending on the device used to access the platform. Along with these specific ways of interacting with content, all videos can be Liked or Disliked and which suggest a general sense of approval or disapproval of the contents, respectively. Further, these public communiques can be contrasted with Private Messages that are sent directly to the Creator (or indeed any user that one has found an account for, such as through a comment or chat message) in question. It should also be noted that while content on YouTube is usually accessible freely to anyone that has access to the YouTube website or application, there are cases where live streams and other videos can be hidden behind a subscription fee that is similar to a cable or Netflix subscriptions.

3.3. Virtual idols and community

Further enhancing the experience of virtuality is that these performers do not appear as humans, but rather as animated avatars representing fictional 'virtual idols' who are "a computer-generated equivalent of the Japanese *aidoru* [アイドル], or idol, a pop star cum actor who can be taken as an extreme example of corporate attempts to prefabricate celebrity" (Black, 2006; emphasis and Japanese added). An even more virtual form of virtual idol can be found in Hatsune Miku, whose manifestation is completely virtual and whose production of self can be seen as even more ambiguous (Jørgensen et al., 2017). HoloMyth's idols, while visually virtual, are voiced by people, a point openly acknowledged by the idols and understood by the audience. However, this is still in contrast to the common practice of live streamers showing live footage of themselves playing the game (T. Taylor, 2018), presumably adopted by Hololive and the virtual idols as a generally accepted language for this style of media. While this is not a study of idols *per se*, there are implications to being described as idols as opposed to being 'live streamers' ,'entertainers', or 'performers', but can also be referred to as 'VTubers', a portmanteau of 'virtual' and 'YouTuber'. This term is perhaps particularly useful in this thesis given the geographic specificity that it suggests, but it can likewise be questioned since it is a community that traverses multiple platforms. It is a term that can further be complicated by its use by similar entertainers that make use of an even broader selection of digital platforms to live stream on as well as having more freedom to act than the Japanese *aidoru*.[14] I will in this thesis prefer the term 'idol' for the members that are a part of HoloMyth to highlight their connection with the *aidoru* tradition, while also highlighting that the idols seem to come from Anglo-European cultural diasporas.

[14] For instance, the VTubers associated with VShojo (n.d.) span across more online platforms, perhaps being more associated with Twitch.tv than YouTube, and can make use platforms that allow them to post pornographic material that would otherwise not be allowed on these larger platforms. VShojo also explicitly rejects structuring itself as an 'idol company' in the way Hololive seemingly does.

As Monden (2014) has noted, there exist cultural differences between Euro-American and Japanese aesthetic portrayals of beauty, both male and female, that can be understood through the lens of *kawaii*[15] mannerisms and appearance which have subsequently been adopted by English-speaking *otaku*[16], and in so doing have amalgamated these Japanese understandings of beauty with Western[17] ones (i.e. Galbraith, 2004; Kinsella, 2019; Lukacs, 2015). Indeed, we might be better served understanding that "the complexity revealed in our cultural commodities has reached a point where it is no longer possible to apply any kind of national boundary to these objects" and that we should "treat them as trans-national products in scholarly inquiry" (Grau, 2019: 80). So while this is not a study about the phenomenon of the formation of internationalized beauty standards on the internet, a basic understanding is nonetheless integral because it is through such 'trans-national constructions', in this case of beauty/cuteness, that these communities find central figures to gather around and develop their own communal grammar. It is in part the idolizing nature, with the audience's gazes directed towards these idols, that make up the digital landscape—which is to say the technological functions that define the participatory parameters of digital space—in combination with the ability to affect the atmosphere of the places they participate in by interacting with the idols and each other that is interesting to study (cf. Galbraith & Karlin, 2012).

The virtual idols that are a part of HoloMyth present in my reading of them as female, even though their digital gestalt would potentially allow for more fantastical interpretations of what a body can be. However, as Black (2006: 40, emphasis added) has noted, "*kawaii* representations of the body are figures from which evidence of certain biological processes have been exorcized entirely, a state of affairs never possible for living, fleshy bodies" and, in being made free of both interior and given a smooth exterior, become uniquely positioned to be projected upon. While the character's constructed and developed personalities will certainly be given more life as part of the Discussion, a cursory introduction can be given here: Gawr Gura (がうる・ぐら)[18] is a sentient humanoid shark, Mori Calliope (森美声) is the Grim Reaper's first apprentice, Ninomae Ina'nis (一伊那尓栖) is a human who learned to manipulate tentacles from a tome of power, Takanashi Kiara (小鳥遊キアラ) is a humanoid phoenix, and Watson Amelia (ワトソン・アメリア) is a human detective investigating the existence of the other four characters (Hololive, n.d. a-e). Each of these characters has their own community, whose fans are referred to with thematically related names: Gawr Gura's fans are called 'Chumbuds' or 'Shrimp', Mori Calliope's are referred to as 'Dead Beats',

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[15] 可愛い; used here to mean a naïve, infantile cuteness that can be applied to both children and adults with differing implications (Jisho, n.d. a).

[16] オタク, おたく, or ヲタク; used here to mean an obsessive fan that devotes most of their time and energy to a particular subject (Jisho, n.d. d; cf. Ito et al., 2012; Galbraith et al., 2015; Galbraith, 2019).

[17] 'Western' is here used to emphasize its underlying heterogeneity rather than the potential for generalization that such a broad term might otherwise imply.

[18] A note on Japanese name order: the surname is written first followed by the personal name as opposed to the personal name/surname order that is commonly used in the West. 'Gawr' is thus the surname, and 'Gura' is the personal name. I will be using this Japanese name order for the characters going forward in this text.

Takanashi Kiara's fans are employees of 'Kiara Fried Phoenix (KFP)', Ninomae Ina'-nis's fans are called the 'Tentacult' or 'Takodachi', and Watson Amelia's fans are known as 'Teamates'. The multiplicity of terms can at times cause confusion among the various communities, indicating forms of informational asymmetry between, and even within, communities.

While each of these idols has their own community of fans, they also interact with other idols in combined streams in either English or Japanese, often blending the two languages. The actresses that are a part of Hololive EN can to varying degrees perform in both English and Japanese, with differences in Japanese fluency between them that lead to irregular Japanese-only or educational Japanese live streams that are more niched toward Japanese-speaking viewers (or those learning the language) than English-speaking viewers. While this might at first glance seem to limit the participation of non-Japanese-speaking viewers on ostensibly English-language channels, the potential to understand and, crucially, to feel like they can still take part in a wider community is offered by 'clippers', other audience members that record and upload 'clips' taken from live streams—either as a simple recording or edited to a greater or lesser degree—that often provide translations for non-fluent viewers, even for members not necessarily fluent in English. Esteves (2018) has outlined various strands of 'remix' traditions that one can apply, but of greatest interest might be the intersection between punk and craft cultures that focuses on the amateur expression of being part of a community and where, given a certain fluency of allowed symbolic grammar and the necessary tools, allows anyone to take part with less emphasis on the quality of the product created and more on the act of having created.

While the communal importance of the relationship between performers, clippers, and audience(s) will be explored in more depth later as part of the Discussion, it is important to understand that the communities that are explored in this text are not exclusively created by viewing live streams or in the textual discourse that takes place in the live text chats of these live streams, but through an audience viewing and creating a collective memory for their community. This can take place through viral distribution of clips, memetic 'remixing' of comments or occurrences either on-stream or from other platforms where communication takes place that create a communal language that in turn reshape the relationship between audience and idol (Esteves, 2018; Shifman, 2011). Clippers and remixers act as a 'self-selected network' that codify, maintain, and over time adapt communal memories, contextualizing them within other memetic grammars that community members might or might not be familiar with.

3.4. Data collection and data considerations

The data used was gathered by taking field notes while viewing the live streams and their live chats as well as while accessing and viewing various videos uploaded by clippers and reading through the comments. It should be noted that I selected live streams as the primary place of observation because of the importance it has as a part of the community itself. Without the live streams, there would be no communal interaction, at least in the way they were organized at time of writing. The observations took place in two parts (see Fig. 1). The first part was a two-day 'test run' in the middle of

Two-day observation test run (10 hours)

Day 1	Day 2
5 hours	5 hours

Five-day observation period (35 hours)

Day 1	Day 2	Day 3	Day 4	Day 5
7 hours	8 hours	3 hours	12 hours	5 hours

Fig. 1. *A breakdown of the 45 hours of observation time distributed across two observation periods.*

March 2021 where I adopted a fixed schedule of five hours of observation, but realized during the first day that this needed to be changed since the time between 12:00 and 17:00 I had selected happened to only include the last hour of a live stream. This led to me adopting more flexible time allotment on the following day where I freely distributed five hours during the day in order to adapt to the live streaming schedule. This flexible time allotment was important because of the variable length of the live streams themselves (between one and eight hours) as well as the highly variable length of time the public, albeit unarchived, 'pre-chat'[19] was open (observed to last anywhere between 10 minutes and 37 hours). The second part was performed during a five-day period in early April 2021 where I distributed 35 hours of observational time using flexible time allotment.

The data was collected over 45 hours of observing live streams as well as related clips and posts on other platforms as and when they were made relevant during the live streams, such as if they were mentioned by the idol or chat participants. I decided on the format of densely-packed observations in this way because it seemed during my test-run that interactions built on each other quickly, meaning that the same number of hours observing over a longer period of time might miss the point a change in behavior took place as well as miss all of the minor interactions that did not lead to any changes. This has, of course, had the effect of making the data collected a snapshot of a certain time period. Because of the length of the observations, I acted as I might when watching TV, leaving to use the bathroom or get something to drink. In the case of longer pre-chats, would jump in at regular intervals to note any changes that had occurred by scrolling through the messages that had been archived, which seemed to be a normal activity even among the pre-chat participants. These behaviors seemed to be common among live chat participants.

[19] This term will be explained in more depth in the Discussion, but is in brief the live chat that occurs before the 'real' chat that takes place during the live stream.

Notes taken included observations, interactions, personal reflections, and quotes of particularly relevant comments along with timestamps and links where relevant so I could return to the source material as necessary. The observations were complemented by personal entries reflecting on my personal reactions. These entries acted in part as personal reflections on my own thoughts and were subsequently coded to find patterns in order for the results to be placed in a theoretical context and to suggest changes to the theory or other avenues of thought.

Much like how one cannot assume the objectivity of a camera lens when presenting images of social interactions (Chouliaraki, 2004), it seems equally relevant to present the hardware and software that mediated my observations. All notes were taken using TextEdit, an application available as one of the text editing programs on the 16-inch MacBook Pro from 2019 (macOS Catalina 10.15.7) I performed the majority of observations on. Some observations were performed using a Samsung Galaxy J1 Ace smartphone (model number SM-J111F, Android 5.1.1) and the YouTube application downloaded for free from the Google Play store. Websites were accessed using the Firefox web-browser (78.8.0e 64-bit). It should be recognized that the use of a laptop or smartphone has implications for spatial considerations when performing the observations since a laptop makes adopting different physical places to observe simple when compared to using my previous desktop computer (see Fig. 2).

The observations also extended to viewing clipped and remixed segments taken from live streams that are uploaded by other users and how the Recommendations would alter my perceptions of what is important or unimportant to see. During the observations, I took screenshots of various layouts that were used using the function on my computer while viewing live streams in order to see how the chat might be prioritized, and what such visual organization might indicate for the perception of community at any given time. ‘Screenshots’ are a way of capturing an image on a computer screen, with some variation in naming convention depending on how they are used or where the function appears. Lunenfeld (1999) has used the term ‘screen grab’ in order to exemplify a screenshot that captures the entire screen, both what one desires to capture and what one does not, which is mirrored in the ‘screenshot’ function one might find on a contemporary smartphone. However, some screenshot tools, such as the default screen-

Fig. 2. *A panorama image of the physical room in which the research took place taken from the room’s entrance. Source: iPhone 6 / iOS 12.5.2 / Björn Nordvall.*

shot tool found on an Apple computer, can allow the user to capture only a single window or a self-selected part of the screen. The increased granularity of the screenshot's function should not lead us to think that the ambiguity that it might capture has been lessened; rather, it suggests that the ambiguity of what we present has only increased by allowing us to frame what once was an entirety.

Despite being unable to assume the same type of anonymity when observing digital space as walking on a sidewalk and following the ethical considerations outlined previously, I have elected to anonymize the quotes I make use of in order to provide a semblance of privacy.[20] Text quotes have been anonymized following in what form they were originally displayed and in the order that they appear in this text, and any screenshots have had usernames and profile images hidden. For example, the first time a message in a live stream chat is quoted, the quote will be attributed as 'Live chat message 1', the third comment of a video that is quoted would be shown as 'Video comment 3', and so on. This serves the dual purpose of anonymizing the data while also highlighting the spatial differences of where messages are produced. This choice can, however, unintentionally make it seem as though the quotes taken are not dependent on the specific contexts that they are created in. I have not, however, anonymized public statements made by the HoloMyth idols or the usernames of clippers/remixers as part of the material that they publish to YouTube with the assumption that they are aware that they are making the material publicly available.

The nature of how digital communities take place over different platforms raises the issue of 'absent data', or the data that become inaccessible because of removed accounts, deleted posts, changes to privacy settings of users, as well as changes made to the platform itself, when gathering data (Freelon, 2021). While this problem is minimized in this study as it might relate to the observation of live streams and the production of observational notes, it can be encountered if a particular live stream is not archived—for instance if there is an associated assumption that it can be accessed later for clarification—and all the more important to be aware of when it comes to the (in)accessibility of clipped videos or other forms of communication. This inaccessibility can at times be mitigated thanks to the existence of other recordings that can be posted, but these secondary posts of the data are not entirely reliable. In some cases, absent data can be accessible in the form of purchasable datasets (Keller & Klinger, 2021), on internet archives such as the Wayback Machine[21], or be inferred from the 'trace' data that are left behind in order to find other data that are either related to or exact copies of the data that no longer exists (Humphreys, 2021). For this study, however, I instead elected to rely on my ability as a note-taker, finding that there might be a strength in things half-remembered and, thus, mimicking the individual's remembrance of communal rituals, but also as a result of algorithmic restructuring in the digital environment, something which is difficult to account for and, despite trying, is even more difficult to replicate;

[20] This might be nothing more than a minor inconvenience if someone is dedicated to finding the original post, the internet is quite an exceptional tool for searching after exact text matches on the internet, but perhaps the infinite monkey theorem might eventually come to my aid.

[21] Available at time of writing at: http://web.archive.org/

and while rigorous note-taking can do much, it cannot make up for lapses of concentration.

3.5. Ethics of studying digital geographies

It is in part because of YouTube's functions that the division between private and public space becomes muddied and gives us an indication of the ethical considerations we have to make when moving forward with research in the digital. Certainly, while the videos and associated text in the form of chat messages or comments are public, this is not always the perception of users who are generally logged into an account in order to partake in the communication that creates a sense of community (Markham & Buchanan, 2012). 'Lurking'—the act of participating in a forum or other digital community by merely reading posts without making oneself known—is by no means an uncommon way for non-researchers to act when first entering a digital community in a way similar to taking in a room before approaching people to start a conversation, but private use should not be taken as the ethical standard for researchers when deciding to engage in covert research since the end goals of a private user and a researcher are not the same (Popova, 2020). Where both user and researcher might lurk in order to observe the customs and rituals of a community, the user does it to potentially join the community while the researcher does it in order to find data that can be analyzed, placed in theoretical context, and ultimately published.[22]

As Eynon et al. (2017) have noted, studying phenomena on the internet carries with it an uncertainty about the individual relationship with physical space[23] since access to the internet is not, as a rule, limited to a single point of entry in the physical world. Indeed, while there exist guidelines at institutional and national levels that suggest how one should proceed with more local research, these may contradict or even interfere when discussing the juridical or social norms when discourse takes place across such borders. The aforementioned nature of imagined communities notwithstanding, there are very real institutional apparatuses that are bounded in physical space by territorial borders that have an effect on what constitutes ethical research that must be acknowledged, both with respects to the participating individuals as well as the laws under which the platform operates (Abidin & de Seta, 2020; Eynon et al., 2017). Markham and Buchanan (2012) have suggested that some help can be found by using international policy documents that establish fundamental rights for and extend them to all humans as a starting point and then applying them to the specific research context and understanding the unique ethical implications for the study in question and the na-

[22] This is not intended to make it seem as though I did not lurk at all, since lurking was essentially the basis of my research design. While not applicable explicitly to this study, Maddox (2020) has warned of 'contentious visibility', or the dangers of clearly presenting oneself as a researcher known to the participants of the community being studied. This highlights the perception of anonymity and safety that can arise within online groups that is broken by publicly declaring an intent other than what is perceived as common use (Markham & Buchanan, 2012).

[23] The authors use the term 'geographic space' which, while relevant in the context they have written, can cause some confusion to the reader given our current use of the term. I have elected to exchange their term with 'physical space' which more clearly aligns with how we've used the term previously.

ture of the data being used. This is certainly complicated by the fact that information can be of variable importance depending on when it is accessed (something that might today be innocuous could be of grave importance tomorrow), where they are gathered (in the sense of the platform that is being used) and the level of privacy that is assumed or perceived by the individual (something that is complicated further by the sometimes insular nature of online communities).[24]

For the purposes of this study, I took on the role of passive observer when viewing the live streams or accessing information available on other public distribution platforms and will approach them as akin to other public places in what might be termed, following Jorgensen's (1989) spectrum of 'complete outsider' and 'complete insider', and more precisely a state of 'familiar outsiderness'. The passive approach, while useful as a way of not affecting the object of study, can likewise be argued curtail the fullness of observing how the individual is algorithmically defined by YouTube specifically because it uses the individual's interactions with videos to decide what other videos to recommend to them.

The autoethnographic viewpoint allows me as a researcher to get a closer look at how space is experienced, to reflect on their deeper meanings, and hopefully to see another side to space that might not otherwise be seen in quantitative data (Adams et al., 2015). As Humphreys (2021) and Hine (2017) have noted, digital studies are awash in variety when it comes to innovative uses for existing methods as well as the development of novel solutions to the new problems that digital studies pose, with the use of mixed methods prevalent in order to balance for the potential weaknesses that the exploration of methods may lead to. This methodological diversity requires in its turn a transparency regarding how methods are selected; to wit, potential readers may not be fluent in the methods that were used, in order that they may judge the quality of the research done in order to judge the value of the knowledge produced, and that they can fully make use of or modify the methods that they may become useful in other contexts (Hine, 2017). Further, self-reflexivity is an important component to creating a sense of stability in the research by assuaging doubts about methodological choices that were chosen when performing ethnographic research and the viability of gathered data as research material (Abidin & de Seta, 2020; Adams et al., 2015; Flick, 2018).

In order to establish an observable algorithmic relationship with YouTube, I created a new account on YouTube that is not related to any of my other accounts, but limited my interaction with the community to 'liking' public content (which is to say, items that would be available even without creating an account) so that I would be recommended similar videos, and to 'subscribing' to the channels of the idols and the community's clippers as I come in contact with them. This has the additional benefit of allowing me to also collect the material accessed on the platform for later reference in a

[24] While the anthropocentric view of physical space can be questioned (and perhaps should be, given humanity's tendency towards material excess), it might be useful to even now question digital spaces in the same way. While the digital stands alone among all the spaces inhabited by humans as being distinctly homogeneous from an ecological standpoint at time of writing, we should consider the fact that humans are also actively working to populate the digital with purely digital creatures: artificial intelligences that, potentially, can develop identities of their own. Are we ready to create life, to become gods? And are we ready to live with our creations?

personal ‘playlist’. Of course, this interaction in itself will change what is recommended to me while using the platform in ways that cannot always be known beforehand or understood. I will also access public information on other platforms following the recommendation of the idols or other community members in order to see how places beyond YouTube might interact with the community interactions on YouTube.

The inherent anonymity of being on the internet might create the perception of a level playing field—hidden as one might be by lurking or behind a username and profile image—it simultaneously creates an artificial façade of equality when socialized structural differences and perceptions of self are still being followed, or merely provides another way of stereotyping users. As a 30-year-old, heterosexual, white, and male university student[25] living in Sweden who more or less grew up on the internet and with internet culture in the form of late 1990’s chat rooms, forums, and text multi-user dungeons (MUD), early 2000’s Homestar Runner videos[26], playing the *World of Warcraft* (Blizzard Entertainment, Inc., 2004-2021) massively multiplayer online roleplaying game (MMORPG), and the development of social media from curiosity to necessary part of interpersonal relationships, I have a certain way of presenting myself and a certain perception of what internet use should be and how it can facilitate creation of communities: in part naïvely optimistic about its possibilities and in part jaded by the many barbed remarks given and received. Of course, in terms of internet use, having grown up in the southern USA also places me in a certain category of online users, being largely accustomed to an English-language internet as a native English speaker and comfortably ignoring the existence of other linguistic spheres save for the few times they cross my path. These linguistic spheres are more often being overcome and interlinked, but despite the fact I’ve lived in Sweden for ten years I still rarely leave Anglo-American digital geographies. This choice of subject, approach, and interest in the digital as geography can likewise be somewhat attributed to having worked for the past decade as a project manager and graphical user interface (GUI)[27] designer of computer and smart-

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[25] Not to mention that these terms have innumerable subjective meanings associated with them that make them problematically generalizing to throw out in order to create the illusion of reflexivity. My personal understanding of heterosexuality, for example, might in another’s eyes rather be understood as bisexuality or as a toxic representation of masculinity. To provide a truly thorough understanding of my individual representation is, unfortunately, beyond the scope of this thesis, but I hope that you can gather a sense of my positionality and why I draw the conclusions I do.

[26] Adobe Flash videos that were shared by sending links to the Homestar Runner webpage (https://homestarrunner.com/) by email or on Myspace, but are available at time of writing on YouTube (https://www.youtube.com/user/homestarrunnerdotcom).

[27] On a professional note, there are slightly different meanings when describing interface design in terms of ‘UI’ (user interface), ‘GUI’ (graphical user interface), or ‘UX’ (user experience) thanks to different prioritizations in how a designer positions themselves in relation to the user that are not necessary to delve into here. Ash et al. (2018a) have looked at how power relationships in the production of interfaces take form, but there seems to be potential for exploring how these approaches might change the intention, if not the presentation, of landscapes similar to what can be seen in planning literature (i.e. Flyvbjerg, 2014; Lynch, 1964; Roy, 2009; Scott, 1998; Yiftachel, 1989).

phone software.[28] Further, while I might present myself through a specific interest, my conversational references and conversational syntax can still reveal things about my socio-economic background.

3.6. Research limitations

The selection of a method creates limitations on what data might be gathered, and thus exclude other types of knowledge that could have been gathered using different methods. One path that was considered was the use of interviews, either as a complement to the autoethnographic observation or on its own, which would have provided more in-depth knowledge about how individuals perceive their position in the community and reflection on what the community meant in use. Another potential path was to perform a more quantitative study by making use of available datasets, which would encompass a larger amount of time than the time I spent observing, but would have simultaneously ignored the pre-chat content that is not archived by YouTube. Finally, I am also limited in the potential to extrapolate universal truths about online communities from these observations. The quotes used in the Discussion have been selected for their broad relevance and try to represent the many different understandings within the five communities that have been studied. Unfortunately, given the roughly 6 million subscribers that follow the five idols and the hundreds of thousands of views a single video can attract, there are many more opinions and understandings than can reasonably be represented here, so necessity has limited me to only discuss the broadest tendencies. This is not to say that there is no possibility for extrapolation, but the information is undeniably situated in my own experience at certain times and of certain places, certain functionalities, and how discussions were framed (or explicitly allowed or disallowed) by these functions and its participants.

[28] It might be necessary at this point to make clear that neither I nor the company I work for has ever been contracted by YouTube, although our clients have made use of other products and services made by YouTube's parent company, Google. Any previous experience I have of the platform is solely as a user.

4. Findings

It is a rainy evening in Stockholm as I sit down at my computer, setting my dinner down next to the community that I join. Some Dead Beats are already there, waiting for Mori Calliope to arrive and start the live stream. The live chat speeds along with excited conversations between friends and new acquaintances, like fans waiting for a concert, for the event, to begin. My screen is filled by the live chat and the thumbnail[29] showing what we are all here for, but it is also filled with advertisements and recommendations showing the potential ways I can continue my travels within Hololive.

While HoloMyth can on the surface be understood as a monolithic community, it is more useful to understand it as diverse as any other community consisting of diverging views and interests, understandings, values, and ideas; it is multilayered and complex. Like neighborhoods in a city, HoloMyth exists as a subset of the broader Hololive and Holostars communities more or less intertwined with other collections of communities associated with the individual idols (see Fig. 3). It is not uncommon for these communities to overlap: some pre-chat participants were very knowledgeable about other Hololive/Holostars communities, but one might consider the difference in community membership between, at time of writing, Ninomae Ina'nis's roughly 911,000 subscribers and Gawr Gura's roughly 2,540,000 subscribers as an indication that not all people are

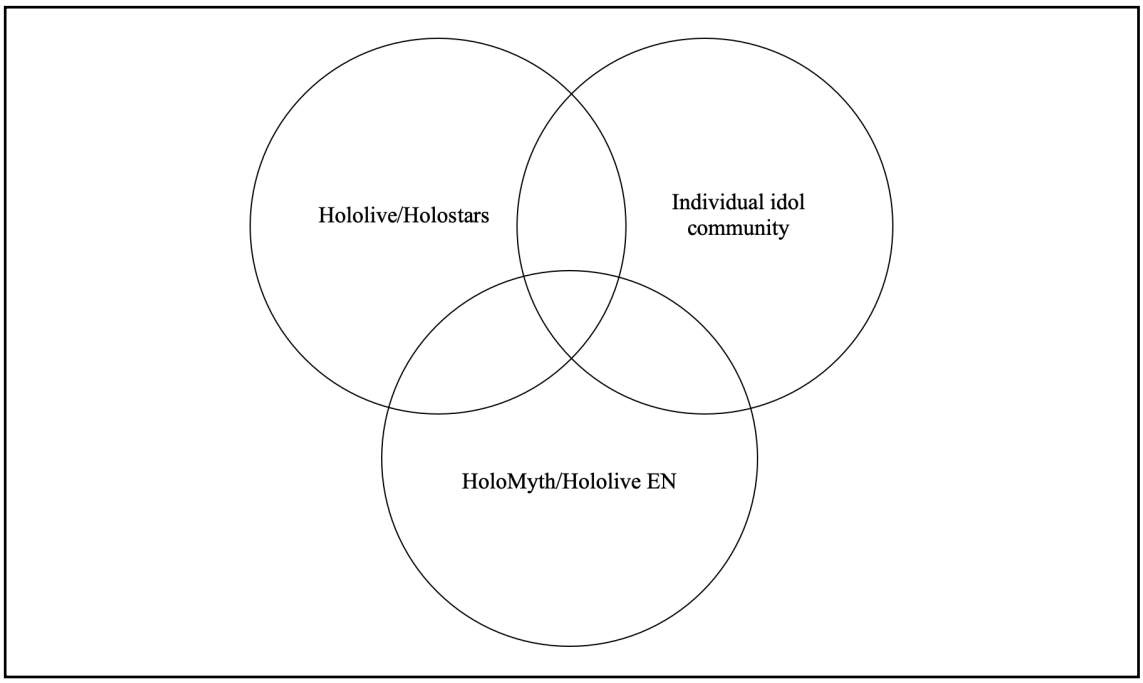

Fig. 3. *A Venn diagram illustrating broadly how an individual idol community might overlap with the broader HoloMyth and Hololive communities. Note that this does not show the potential internal complexities of the respective communities, and that HoloMyth and Hololive EN could be considered equivalent at time of writing.*

[29] Thumbnails are still images that represent the video before viewing it. These can be a still-frame taken from the video itself, or a unique composition, often in the form of a collage of images and/or text, to catch the viewer's attention.

as interested in participating in every potential communal space. Further, direct participation in the live streams does not necessarily correlate with (un)familiarity with other communities thanks to the many collaborations that occur between idols or by watching clips of longer live streams. While my primary interest was to observe the communities of HoloMyth, I was made constantly aware of occurrences in other Hololive communities thanks to the ever-changing contents of my Recommendations List while performing my observations. By the end of my observations, around half of the Hololive-related content was for Hololive members not a part of HoloMyth, and much of this tangential material was translated from Japanese or Indonesian into English making it possible for me to understand.

As they gather, contributing to the flush flicking across my screen, the mood changes. The advertisement starts playing and I hit the "Skip ad" button as soon as I can. Music is playing and a *chibi*[30] animation of Mori Calliope headbanging is playing on a loop. I take a bite of my dinner and bring up a blank text document, overlaying a part of YouTube with a blank text document. I have been waiting all day for this, and I cannot help but be drawn into the excitement rising inside me. It is also comfortable having people to eat with, even if they do not know that I am here, that I am eating, or where in the world I am sitting. Even though I'm here to work, it feels like I'm surrounded by thousands of friends.

4.1. The atmospheres of a YouTube live stream

As when thinking about atmospheres in the lived physical environment, atmospheres in the digital are created by the combination of social interaction in relation to the structures of the environment one is in which, in turn, reinforce the perception of community. The role of atmosphere in understanding digital communities is found in the way that they allow us to think about not just the messages themselves, but the context within which they are sent and the feelings that they lead to. Just as with the physical world's atmospheres, digital atmospheres are created by the combination of social interaction in relation to the structures of the environment one is in. An important part is the visual spectacle both inherent to YouTube as place—which is to say the difference in color for members, whose usernames are shown in green, and non-members, whose usernames are shown in gray—as well as the spectacle unique to every individual community—best exemplified in both the audio-visual design of the live stream itself as well as the unique emotes and membership icons that are usable in the live chat. The latter makes possible certain forms of interaction in one community that are not available in another, or requires more creative ways of performing the desired actions.

Using atmospheres to understand digital community shows that a live chat can be seen not as a single space to interact in, but as many different forms of interaction. The pre-chat allows for more personal and shifting engagement with each other whereas the live chat that is engaged with during a live stream is instead less self-determined and more ritualized, much like a concert or sports match. Viewing the use of multiple platforms in terms of atmospheres allows us to further see how the feeling of communal

[30] 禿び; used here to mean a drawing style emphasizing the cuteness of a character (Jisho, n.d. b).

belonging extends beyond YouTube itself and how conversations can be interpreted differently by having access to different places of interaction, comparable hearing someone laugh on a street only to realize that they are watching a movie or missing something that happens because they are nose deep in a book.

4.1.1. 'Pre-chat' and experiencing space

> *Live chat user 4: "I missed these loooong prechats, love chatting with you guys"*
>
> *Live chat user 5: "I forgot to say hi to @Live chat user 6 ! Love ya buddy"*
> *Live chat user 6: "@Live chat user 5 thanks and love ya too man"*

While not nearly as popular as the live streams or even watching clipped material, the pre-chat is where community-as-communing most recognizably takes place. The individuals in the pre-chat make use of the live chat in form and function, but there is no ongoing live stream and at least in my observation it seemed exceedingly rare for one of the idols to write messages until it came closer to the start of the live stream. In contrast to the idolizing that takes place during a live stream, the pre-chat instead allows for personal, self-determined interactions between the fans themselves which, in turn, leads to conversation that ebbs and flows as people arrive, leave, introduce themselves, misunderstand, or mention a stray thought. Rather than displaying video content, the static thumbnail is shown, and rather than showing a publishing date, a timer is shown to inform the viewer of how much time there is until the live stream will start. These visual markers of *beforeness* create a different atmosphere from the live chat, something that seems to be born from the lack of having a conversational framework that is encountered while watching a live stream. It is the meandering nature of the pre-chat that created what I felt was the most obvious place of communing, with several of the participants recognizing each other and, as the quotes suggest, filled with relationships associated with strong positive feelings. Indeed, regular participants were able to recognize each other quite easily from only the username or profile image even when the other had been changed, and in one instance was able to recognize another regular participant from the syntax of their messages.

A pre-chat can be publicly available for very different lengths of time, depending on when the live stream was scheduled for and depending on the content creator's settings: the shortest pre-chats I observed were for Watson Amelia, but I have reason to believe that these were members-only pre-chats that were made public a few minutes before the live stream started. The longest pre-chat during my observation periods belonged to Mori Calliope, which I observed lasting around 37 hours. Entering the short pre-chat was like jumping into a storm, a point that will be returned to in the next section discussing the 'flush', but the extreme difference between the length of these two live streams is particularly interesting in how they frame the atmosphere that the individual enters into. I participated intermittently in the 37-hour pre-chat, moving in and out as I worked and slept and would observe the participants interact as they watched other ongoing live streams and used the pre-chat as a private room for discussion about

other streams. This highlights the temporality of communities, showing how participants move in and out of different digital communities based on their physical needs or their changing social needs.

It is noteworthy that explicit rules exist in the comment description of every live stream that indicate how participants should use the pre-chat, often with the intention that the pre-chat should not be used. These rules were sometimes discussed—as erstwhile motivation for why other idols should not be discussed[31] or the counter-argument that if the chat is already breaking one rule then why should not all of them be broken—but they were more usually ignored by the participants of the pre-chat. The reason for this seems to be the atmosphere of beforeness in the pre-chat creates a sense of separation from the live chat itself and, thus, the space where the rules, as defined by YouTube or created collectively, are applied. In part, the video description is physically connected to the video by being placed beneath the video, and which is usually hidden behind a button requesting the user "read more". In a space that is not guided by anything other than the interactions of the chat, it seems that rules explicitly connected to the video are inherently connected to another, and more rigidly controlled, space that will be discussed later; in other words, the live stream chat is not the pre-chat because of the absence of the associated video. This reflects the ways that communities in physical spaces have shared rules enforced by and through a range of institutional norms and legalities; it also reflects the multiple social rules that are practiced in some spaces, but go unnoticed by or not participated in by other groups.

There is a similarity to be found between this and what Harrison and Ogden (2020) have observed in the exchange of information and knowledge in 'knit "n" natter' groups. These groups, while ostensibly unstructured, are still informed by the activity they are based around and can contain 'hierarchies of proficiency'. While these hierarchies existed in the pre-chat, where new people might introduce themselves and ask questions about the upcoming stream and so on, much more prevalent was the free-flowing discourse between participants that had in many cases known each other since the idols had officially debuted and saw themselves, in part, as responsible for creating and maintaining the communities themselves. Despite the manufactured nature of the idols's celebrity, it seems that the communities that assume celebrity are perceived as being organic. This aligns with the notion of 'authority' that O'Neil (2009) has suggested is found on the internet, where hierarchy is based on both knowledge that is valid and knowledge that can be made to seem 'authentic' through its presentation.[32] We see in the pre-chat that there is a shared character between online and physical communities and how they are created, filled as they are with overlapping, multi-layered rules with different forms of social practices and controls.

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[31] A common rule in the observed communities is that other idols or VTubers should not be mentioned by the chat unless the live streamer mentions them or if they are collaborating during a live stream.

[32] One can, of course, question the validity of O'Neil's (2009: 1) initial claim that "all hyperlinks are equal". Certainly, the underlying programmatic structures that allow hyperlinks to function are the same—it is a line of code that sends the user to a designated URL—but it ignores the fact that the placement of these hyperlinks make them more or less visible, their presentation can make it more or less clear where one is going, and to what extent the destination allows the individual to actually enter the space.

4.1.2. 'Flushing' and the proprioceptive spaces of ritual

Live chat user 7: "salute tenchou[33] ....with o7, o is head and 7 is arm. Ready?"
Live chat user 8: "Get ready to flush in 1 min"
Live chat user 9: "gooooo o7"
Live chat user 10: "o7"
Live chat user 7: "o7 @Live chat user 9"
Live chat user 11: "Good luck everyone, flush time o7"
Live chat user 12: "o7"
Live chat user 13: "C ya pre-chat good to see you all again"
Live chat user 14: "o7"
Live chat user 15: "o7"
Live chat user 16: "o7"
Live chat user 17: "Flush o7"
Live chat user 18: "O7"
Live chat user 19: "o7"
Live chat user 20: "im gonna stop greeting folks now o7"
Live chat user 21: "whats o7 mean?"
Live chat user 22: "flush o7"
Live chat user 23: "Flush"
Live chat user 24: "o7"
Live chat user 25: "o7"
Live chat user 23: "o7"
Live chat user 26: "o7"
Live chat user 27: "Flush o7"
Live chat user 28: "o7 is salute"
Live chat user 29: "o7"
Live chat user 30: "\o/"

While the quote above shows a part of the ritualized sending off of the pre-chat, and the welcoming of the live stream chat and the live streamer themselves in what is called a 'flush', it does not do it justice. A flush is a torrent of hundreds or thousands of messages a minute flicking past that can last up to half an hour with the two-fold function of clearing away the pre-chat—explicitly drawing a line between the pre-chat and the coming live stream—as well as to welcome the idol and other fans that will join and are joining the chat. Socially, the use of a salute can thus be understood as a form of respect, a ritualized action to both send off the unarchived conversations that took place in

[33] *Tenchou* (店長) is used here to mean a 'shop manager' (Jisho, n.d. c) and in this context refers to Takanashi Kiara as the 'manager' of Kiara Fried Phoenix, referencing the fact that the acronym of the fanbase, KFP, is a homonym of the American fast food chain Kentucky Fried Chicken (KFC) as well as the fans's status as 'employees' of KFP under Takanashi Kiara's management.

the pre-chat and the time spent there and to welcome the so-called 'notification squad'[34] and the idol to the live stream chat proper. While the pre-chat and 'chat' are functionally identical, the distinction is important since it highlights the atmospheric differences between them. Indeed, it is through the flush that building tension transforms the more or less aimless social meandering of the preceding pre-chat into a focused energy, moving the focus from individualized attention and nuanced discourse into a, at least at a surface level, more unified and homogeneous experience dictated not by the viewers themselves, but instead by the actions of the idol. While it lacks the auditory impact of a crowd chanting or singing as one might experience at a concert or sports event (i.e. Sumartojo & Pink, 2019), it does create an atmosphere of mounting anticipation that mimics the visceral feeling of doing something in unison, enhanced by the change in visual landscape of the stream where the video changes from static thumbnail to animation and the addition of background music.

This is not to say that the switch from pre-chat to chat is seamless. As might be noted in the quote, uncertainty still exists about the meaning of the salute's meaning to new users, while actions more suitable to the pre-chat slowly disappear thanks in part to the increasing number of messages and, thus, the number of users that appear which makes that form of communication difficult. Unlike physical environments where there might exist real or social external barriers to letting new people join in, these barriers are for the most part lacking for publicly available live streams so long as one is able to access the website where they can be found. However, as Sik (2020) has noted in a study of how one joins and becomes a part of an online forum for depression, this does not mean that these spaces are lacking in social norms. Indeed, one goes through processes of understanding these norms, where the difference in allowed actions between the pre-chat and chat itself need to be learned—a way of becoming part of the community. Contributing to the ritualized messaging in the chat seems to be the simplest actions to adopt and participate in, much like one can imperfectly chant or sing with sports team's supporters or the chorus of a song since it is not so much the perfection of the content, but the act of acting in concert with others.

Indeed, acts similar to flushing were common across all five communities that were studied, often related to recurring jokes tied either to specific games that were being played—it took me longer than I care to admit to understand that the chat's repetition of "Mozambique" was not an attempt to draw attention to the country's politics or people, but a reference to a weapon with that same name in the game *Apex Legends* (Respawn Entertainment, 2019-2021)—or when specific habits or catch-phrases were used by the idols themselves—exemplified by the various ways that Watson Amelia hiccuping or Mori Calliope saying "guh" are noted by the stream's viewers either by typing or using emotes to repeat the phrase. Likewise, the flush itself was at one point used in the pre-chat as a tool to physically remove conversations that were making some participants of the pre-chat uncomfortable, indicating on one hand the admirable desire

[34] 'Notification squad' is a term applied to users that are notified that a new video has been posted or a live stream is starting through YouTube's optional notification system (either by selecting the notification option for a channel, or by pressing the 'SET REMINDER' button beneath an upcoming live stream shown in Fig. 4). For live streams, users are notified 30 minutes before the planned start of a live stream.

for everyone to feel comfortable and on the other hand a digital manifestation of Mills's (2003) 'tyranny of the majority'. While the various meanings that lie behind these actions are certainly worthy of further research, I am instead interested in how this type of massed action creates *proprioceptive space*.

In its simplest form, we can see the act of watching a live stream as an example of proprioceptive space, the idolizing position of the viewer toward the idol that one is placed in when acting as a viewer. Setting aside the power dynamic between viewer and live streamer, this unity of action found among a viewership creates a sense of doing things in a group by virtue of performing the same actions as others. Seligman et al. (2008: 4) have suggested that "Ritual [...] is about *doing* more than about saying something", encompassing acts that do not require knowledge of why beforehand in order to adopt and be affected by, as a rejection of "a post−Protestant or post−Enlightenment vision of ritual action as a referent for meaning whose true essence resides only beyond the ritual itself". They have argued that this stance allows for ritual to be used to frame action, suggesting that while actions can be framed as ritual, they can equally be framed as something else, whether that be sacred or secular terms. This of course begs the question: why, if we accept that ritual already is an act of 'world construction' that creates an 'as-if' space[35] (Compton IV, 2019), should we adopt a proprioceptive stance in studying these actions? And, indeed, why not make use of other, already existing conceptions of movement in order to understand our movement in these spaces?

In response, I suggest that while movement both ambulatory and embodied do certainly provide methods with which to understand the digital and the ritual, they do so in terms of a relationship with the exterior. This in no way is to suggest that one cannot move through or embody the as-if spaces created by ritual—I would argue that it would be impossible not to do these things—but these terms allow us to ignore the infra-ordinary movements that also take place beyond moving through experiences. Where ambulatory space suggests that it is by doing motion that we interact with space and embodied space suggests that it is by being in space that we interact with space, I suggest that proprioceptive space allows us to consider the experience of performing the same actions and seeing their effect on a place at the same time and, in so doing, allows us to experience a space with others. This requires a correlation between action and temporality, something which is not necessarily the case for rituals which can be atemporal in the sense that one can feel a connection between those that have performed the same actions in the past and those who might perform them in the future. So while flushing and its variations can certainly be framed as ritual spaces, more evident in the digital was the immediate feeling of belonging created by performing the same actions (typing out and sending the messages to perform a flush) at the same time, in what I would characterize as an imitation of the bustle of being at a physical event through the medium of a keyboard and live chat window.

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[35] While Compton IV (2019), following Seligman et al. (2008), uses the term 'world' here, it seems to align with the conceptualization of 'space' as a social construct as used in this thesis. I have thus put the word in their mouths, so to speak, in the pursuit of clarity. However, it should be noted that this can unintentionally change the original meaning of their use, and certainly dulls the rhetorical thrust of proposing the 'construction of ritual as-if worlds'.

4.1.3. Cramped and separated spaces

Live chat user 31: "Chat getting cramped with all four communities here"

The above quote is a particularly interesting example of the intersection of place and space in digital space since it shows the ways that the mode of interacting with the digital place has an effect on the perceived amount of room left for the individual in the space. It is taken from a collaborative live stream, where the idols all performed together on Takanashi Kiara's channel, which required the various communities to gather in the same place. While theoretically limitless, this cramped feeling can be explained in part as a result of the increased volume and rapidity of messages in the live chat. However, beyond the increased volume of messages, there seemed to also be an increase in what might be termed *ritual density* stemming from the sudden inclusion of four communities's worth of symbolisms and, at times, the clashing performances of their associated rituals which, in turn, highlighted the lack of the usual emotive paraphernalia used in the performance of these rituals for the three 'visiting' communities. Indeed, this was made particularly clear given that there was an ongoing pre-chat on Mori Calliope's channel that some Dead Beats watching the collaborative live stream used in order to comment on the live stream while making use of the emotes that they were used to. While there were only a few people that used the pre-chat in this way, it provided them with a place of escape from the cramped feeling of other live streams, and simultaneously gave them access to the tools they wanted to use in order to perform their own rituals.

Importantly, while I did not observe any such streams, my understanding is that collaborations can also take place where each idol live streams on their respective channels. These live streams visually show what is going on from the perspective of each idol while giving full access to the voices of the other idols. This contrasts with the combined streams since it allows individuals to choose which live stream they want to support and what subjective view of the event they most want to view from, in effect creating multiple social spaces around the same event. The interactions between the communities would then either be mediated through what the idols respond to from their own live chats, or by the users actively jumping between the ongoing streams. It is conceivable that some might also be participating in all three simultaneously with the creative organizing of browser windows.

4.2. Community in algorithmic geographies

The screen containing the Recommendations List is, perhaps not inconsequentially, called 'Home', a term that, while commonly used for the primary screen on a website, suggests that it is the algorithm that is the primary form of interaction intended in YouTube's landscape. The algorithm is ever-present when using YouTube, whether when opening the website for the first time or when watching any of a number of videos. These two lists are the Recommendations, which are the visual representations of the YouTube algorithm that is either present or close at hand whenever making use of the website. Of particular interest is the way that the algorithm seemingly compels con-

tact with communities through these Recommendations, compelling the individual to move farther and consume more by rearranging the content of the landscape that one exists in, always showing new information whenever a screen is refreshed or opened.

It is in these meetings with the algorithm, whether while watching videos and live streams or not, where the feeling of being a part of a broader community comes from when on YouTube: through contact with new content to either consume or ignore, seeing live streams that are archived, ongoing, and planned, or by remembering the contents of previously viewed videos when they were again displayed as thumbnails. Certainly, the ever-changing display of novelty, regret, fear of missing out, and memory creates an algorithmic facsimile of the discourse that occurs among a group of friends: I caught myself smiling when recognizing some videos, worrying about missing or having missed live streams, or unconsciously sorting away videos that were not immediately related to what I was studying. It can be argued that these reactions can be due to the fact that I was *observing* rather than *being a part of* a community—a difference which implies that my interaction with the content displayed by the algorithm was governed by other external norms than a normal viewer's—but it nonetheless points to experiences that can be more broadly applicable in terms of interacting with the algorithm. Indeed, the observation as performed can itself be interpreted as an attempt to tailor YouTube's algorithm to only display things that were related to HoloMyth in particular—an attempt that was made all the more difficult by what seems to be an inherent need for the algorithm to introduce novelty beyond what I intended to observe.

4.2.1. Noticeboards and experiencing 'algorithmic viscosity'

> *Observation diary: "Starting a new account feels strange. Every little move I make drastically changes what is recommended, not the more permanent feeling of my usual account. It's like a blank slate, and I feel a little lost in it."*

While by no means a perfect comparison, this is reminiscent of the way that noticeboards[36] are used to inform of happenings in an urban area, either in the form of an urban center (Taylor & Cheverst, 2008) or within a certain building (Kullenberg et al., 2018). Of particular interest in this comparison is not the lifespan of content displayed on these boards *per se*, but the experience of changing content on an official noticeboard by someone—or perhaps more appropriately in terms of the algorithm: some*thing*—outside the self, but that is still impacted by the self. Announcements for town hall meetings are replaced by upcoming, ongoing, or completed live streams, advertisements selling content, videos that take the place of the times where a noticeboard becomes an impromptu art installation, all alongside Community posts including more direct communication (see Figs. 4 and 5). The comparison between this digital land-

[36] 'Noticeboard' is the term used by Taylor and Cheverst (2008) while Kullenberg et al. (2018) have preferred making the distinction between 'analog bulletin boards' and 'digital bulletin boards', the latter of which can for our purposes can be described as the noticeboard's digital incarnation. I prefer the use of 'noticeboard' here for both clarity and because it implies different meanings and practices than using the term 'analog bulletin board' might, both in the relationship between physical and digital as well as what the assumed use (and assumed user) of the space is.

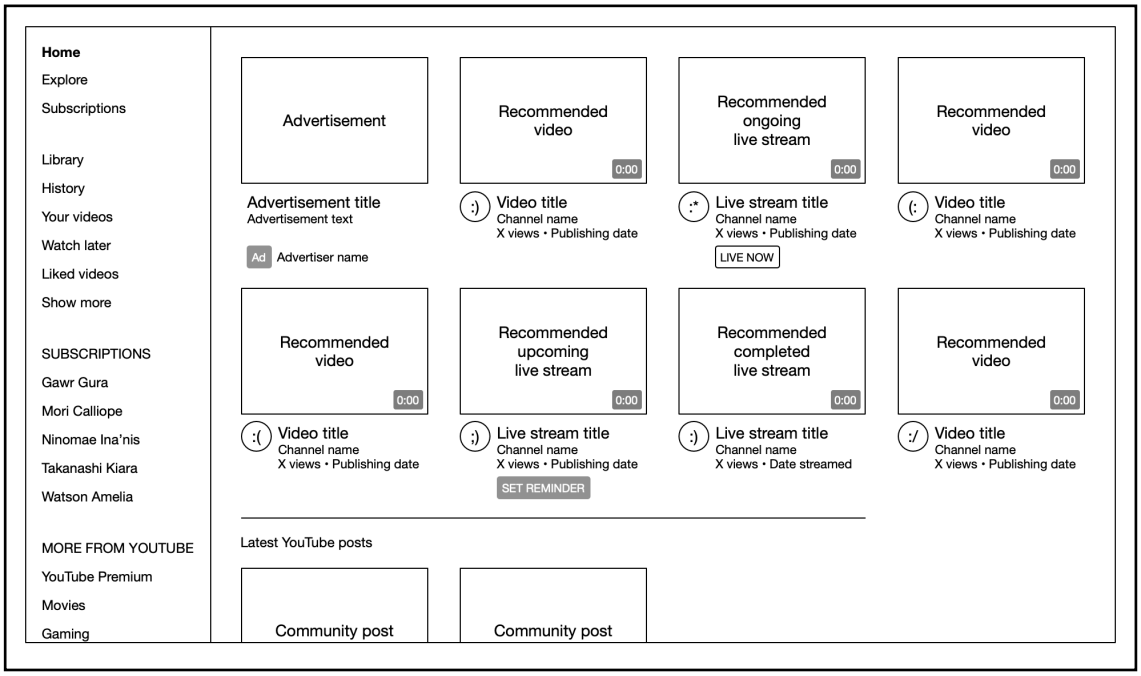

Fig. 4. *A simplified example of the layout of the 'Home' screen as seen on the desktop browser version of YouTube. At left is a navigation bar which allows the user to select which screen they want to see (in this example, 'Home' is selected) and at right are the algorithm's video recommendations.*

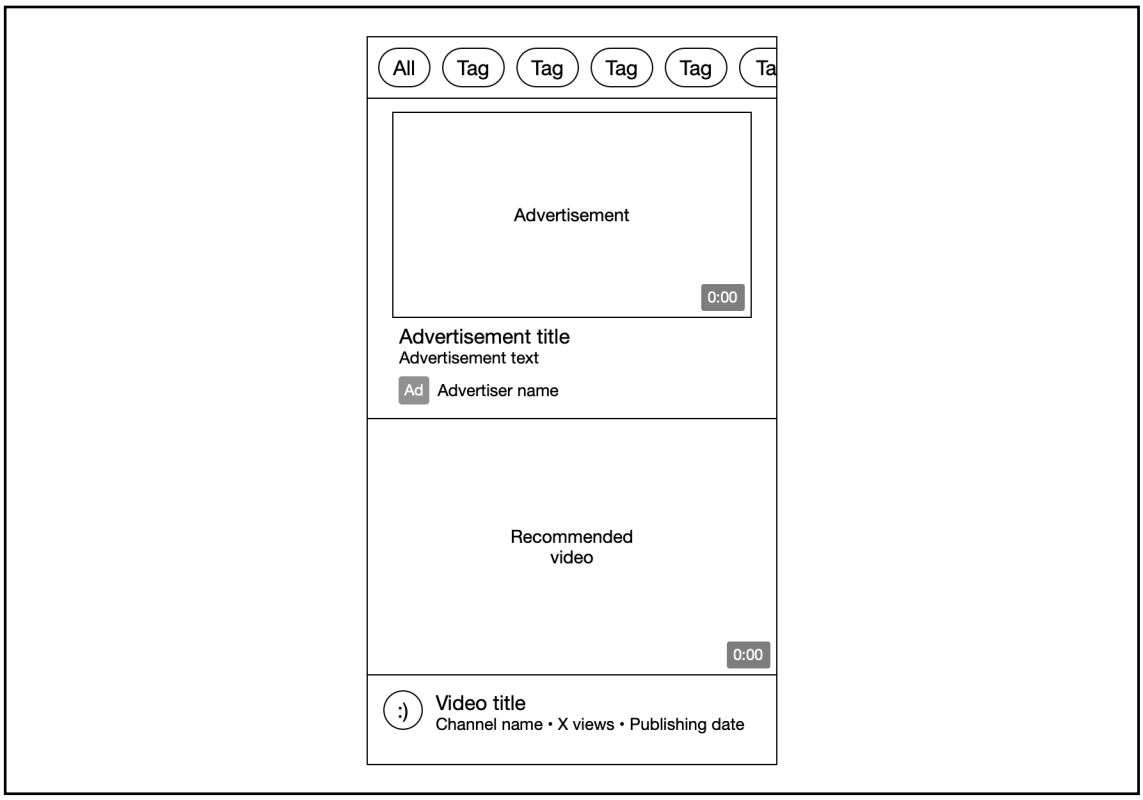

Fig. 5. *A simplified example of the 'Home' screen in the YouTube smartphone app. The number of items are fewer, but this is compensated for the ease of scrolling vertically in the list, which can also reveal different types of videos as shown in Fig. 4. The tags are used for sorting the contents of the screen and are algorithmically decided.*

scape and physical noticeboard allows for a heightened sense of spatial temporality as well. On one hand, the content changes every time the screen is refreshed (although by how much can vary) or can remain the same if (as is often the case for me) a browser tab remains untouched for days at a time, while on the other hand, it conjures the memory of spaces that have been travelled or suggests new paths to follow. Indeed, in this way it acts like the noticeboards that Taylor and Cheverst (2008) and Kullenberg et al. (2018) have described, as something one passes by on the way to somewhere else.

Despite the lack of overt transparency in the algorithm, the results that the algorithm presents are based on my own inputs and thus suggest some type of understandable reasoning for the output that is received, something that might be more tempered when not navigating an algorithmic *tabula rasa*. This realization is an unintended side effect of navigating the algorithm on a freshly-made account that I would otherwise have missed. The first was the experience of feeling 'lost' when using a recommendations list that did not behave as I had learned to expect from my usual account, an account with close to 10 years of nearly daily use, exemplified in the assumptions that the algorithm started making about my linguistic experience following my minimal inputs. Partway through my second observational period, the recommended videos that were related to the HoloMyth channels I was observing included translations from English to Japanese, a change I think has its origin in viewing and liking a clip posted by a channel dedicated to creating and posting Japanese translations of HoloMyth clips.

Out of curiosity, I watched and liked the same video on my personal account with nowhere near the same effect, suggesting both that there is an *algorithmic viscosity* that makes extreme changes from a single choice to the Recommendations less likely the more one has used the platform and the greater the volume of historical inputs and that one remembers this history in greater or lesser detail. For our purposes, this viscosity points to how the algorithm creates an individualized landscape unique to an individual through the history of their various choices of consumption. Various clips associated with interests we have had long ago can appear again, seemingly at random. Despite not always understanding how these processes occur, it suggests that we develop an intuitive understanding of the malleability of these landscapes by existing in a personalized version of that landscape, creating expectations of what effect an input should have in this landscape that nonetheless has unpredictable effects when applied in a landscape that has a different algorithmic history.

4.2.2. Spaces of translation

Ideas of spatiality are important to keep in mind, not because they make it seem as though the physical and digital are inherently separate, but because they suggest the digital and physical are linked both through the local and physical infrastructures that provide access to the digital as well as through the inherent spatiality of languages and their use. The commonness of these translations also goes beyond just clipped videos. Any given live stream can have translators appear in the live stream's chat providing real-time translations of what is being talked about, or translations provided by idols during live streams, either to help the audience or collaborating idols understand what is being said, suggesting that some parts of the community and even some of the idols are

only able to participate where these different communities intersect with help from intermediaries or through mediating content. Beyond this, the linguistic needs of these communities also points to the geographic dispersion of a given community's members, as well as the implication that the digital provides a place for interaction parallel to physical place.[37]

It is in part from the communication of different spatial imaginings where a feeling of belonging to many different communities may come from, both within the specific linguistic sphere(s) that any one person may be able to navigate comfortably as well as as part of the broader Hololive/Holostars network.[38] Italiano (2016) has suggested that the act of translation, both in its literal sense as well as the cultural contextualization that it requires, creates new spaces of where the spatial, social, and temporal intersect and, in so doing, creates new spatial imaginings. While this space is by Italiano seen as a cultural phenomenon, it might also be useful to contextualize it in terms of the socio-spatial dialectic: a translated space creates a new space given the way it creates different imaginings of place as the result of being translated, thus creating a new space with its own dialectical relationship with place, separate from—albeit if not in form, then in content related to—the space suggested by the original text.

This is not to make it seem as though languages carry their meanings as an inherent part of their respective lexicons, but rather that every language and their various dialects carry cultural connotations that can be more or less apparent depending on who the reader is and how they parse the text. There is a notable porousness between these imaginings of place, such as the many comments claiming how helpful certain translations are in order to feel a sense of being part of a broader community or, from the other point of view, the impromptu language teaching that can occur as part of these clips in search of clarity and leading to a deeper understanding of a language one does not know. As can be found elsewhere, it is this practice of knowledge-building that is key for individuals to find belonging in these communities, both in order to understand the interrelatedness of the broader network as well as for learning the social mores that exist for each community individually.

These geographically dispersed communities find a communal lexicon through their shared cultural references, in part thanks to a shared interest in Japanese culture, borrowing terms from Japanese and using them instead of English words, and in the adoption and discarding of memetic references in rapid succession. The mastery of this terminology indicates not just the individual's position within a terminological hierarchy of knowledge, but also the recency of their knowledge. Understanding the complex history of the terms that are used becomes a way of understanding how long one has

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[37] Beyond this somewhat simplistic notion of what the translations might mean, it begs the question: Why have the communities associated with Hololive become so conducive to multilingual participation? Are there similar other communities? While I will not delve deeper into these questions in this thesis, doing so might provide insight into building similarly heterogeneous digital communities.

[38] The multilingual nature of community can in part be exemplified in the references to "JP bros", "EN bros", and "EU bros", terms that indicate the importance of linguistic differences as a way to organize a community, the primacy given to certain geographies over others, as well as a popular assumption of gender bias as part of non-digital idol fandoms (i.e. McAlpine, 2017). However, Galbraith and Karlin (2012) have pointed out that this gender bias might not be as clear-cut as might be expected.

been a part of the community. Likewise, the mastery of these terms is a component to being able to feel like a part of an imagined community spread across multiple platforms and through many different memetic contexts.

4.2.3. Clipping, remixing, and communicating community

> *Live chat user 2: "clip this"*
>
> *Live chat user 3: "I won't be able to make this stream, I'll have to catch the vod after"*
>
> *Video comment 1: "lmao[39], this literally just ended. Clippers really are speed"*

Clips are more than a memetic way of transferring what is thought of as important within the context of the communities, however. While many clips can be a simple recording taken from a stream, many others try to give a broader contextualization for what is going on. These range from those clips that try to enhance the humor of a joke by zooming in on the avatar, highlighting the live chat's reaction, overlaying other memetic references in order to indicate how one is supposed to react to the situation, or unique creations based on clipped content (i.e. HoloLive Sings, 2021; Rizulix, 2020; Sashimi, 2021; Vaan Ch., 2021). Further, one clip can itself become the basis for other variations used as the basis for further memetic changes, for instance in the comparison between Holo Bass (2020) and MatiSleeps (2020). This comparison between two clips is instructive since it highlights the interwoven ways that clips can be created. The original version of the song was created by editing a spoken word reading of a text by Watson Amelia and setting it to music by Holo Bass (2020). Mori Calliope saw this edit and performed a cover of it on a live stream, which was later edited together with the original song by MatiSleeps (2020) to create a new song featuring both idols.

While the irregularity of live streams does create some difficulty when observing these communities, it seems to be particularly well-suited to provide content for communities that include members from an entire Earth's worth of time zones and with an assumption that those that cannot participate live can instead experience an archived version of the live stream, whether as the full recording of the live stream (referred to as a 'vod') itself or as part of the various clips that highlight individual moments, the best moments from a single video, or establish what the experience of viewing either an individual idol, HoloMyth as a group, Hololive more broadly, or VTubers in general.

This does not mean that clipping is not contentious, in particular from the point of view of the idols themselves. Certainly, there is an awareness among the idols of the tendency of clippers to prefer recording and publishing clips of the idol making a fool of themselves or when the idols allow the mask of being an idol slip. This can perhaps be read as an underlying dynamic of control over the personality of the idol, since compared with the *aidoru*, the VTuber idol is popular not merely because of their manufac-

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[39] *LMAO* is an acronym that stands for 'laughing my ass off', indicating that something is very humorous.

tured celebrity to be admired from afar, but because of the immediacy of the relationship between idol and social spaces that are created by live streaming. In this sense, the demand to "clip this" that can appear in the live chat is a manifestation of this creative control, where those watching the live stream in real time make a decision of what is important to 'archive' so that it can quickly be returned to—a statement about the perceived publicness of interactions as a community and about presumptions of when this should occur.

I will leave it to other scholars to answer any questions of the selection processes that lie behind making these demands and what they say about what is and is not important enough to be archived that might be raised, and instead focus on the underlying suggestion of permanence that saying this seems to imply about both the landscape and the continued accessibility of the data itself. Indeed, in contrast to the inherent volatility of representation of data that we have already discussed in algorithmic geographies, it seems to indicate an assumption of permanent access to the underlying volume of data that is saved on YouTube's servers. Even in my own experience, I found myself assuming that I would be able to access streams in their archived form months after I had performed my observations for even the simplest things, such as double-checking the transcription of quotes or to clarify the order of events. However, it is equally relevant in understanding the relationship between a place and how that place is perceived to function.

This is certainly something to be aware of in terms of academic method as applied to digital geographies that we as researchers are familiar with, since it suggests that despite the content that was being observed was unique, I was still blind to the routineness of using YouTube as a platform while performing my observations. Arguably, website interfaces are more and more being designed to be invisible to the user, specifically adopting uniform components and code across websites and platforms in order to reduce the experience of friction when learning new methods of interaction with the landscape.[40] Unlike in the physical, one can experience digital places without being observed experiencing digital places, so long as we allow that contribution is only one of the ways one can participate socially. While mundane, this point is a key to understanding the disconnect between interacting with digital places and content that they contain. Despite having created a new account on YouTube, it was the same digital terrain I was used to where the only apparent difference was the profile image displayed at the top right of the screen.

4.3. Space in many places

Live chat user 32: "I'm actually in class rn[41]"

[40] This is perhaps most apparent for YouTube and its inclusion in Google's broader interface design landscape exemplified through Material Design and a homogenous design aesthetic across not only websites, but also applied as the native design for many Android smartphone interfaces (Material Design, n.d.).

[41] *RN* is an acronym that means 'right now'.

Most significantly, my observations show the ways that digital communities are made by the interweaving of many platforms—many types of spaces—which, like physical communities, have different roles and purposes. Space is not assumed to connected to a single platform and is instead viewed as multiple connections between multiple places of communication: digitally in the form of the various platforms that are used, and physically given the potential to view and participate in community activities from any computer or smartphone that can display YouTube, Twitter, Reddit, and so on, and given an internet connection that can upload the necessary information to the hardware that is being used. The relatively non-fixed nature of digital landscapes in relation to physical space means that they can be accessed (almost) anywhere, transforming in part the experience of digital space, but also impacting physical space as well. While it might always have been the case that physical closeness has not necessarily meant emotional or interactive closeness—it has always been possible to be emotionally distant, lost in thought, etc.—by participating in digital communities we can find emotional and interactive closeness with one community while being physically close with another community.

This uncertainty has an impact on how the communities themselves are perceived by the viewer. For example, I woke up in the middle of the night and was unable to fall back to sleep. The streets outside my apartment building were quiet as the clock on my phone read 2:14 AM. Without thinking too much, I opened YouTube on my smartphone in order to fill the time until it was more reasonable to get up and start my day, and jumped into an ongoing live stream. While the cold slipped in around me through my open window, I felt a deep sense of contented warmth not just from watching Watson Amelia's digital avatar play Mario Sunshine—a video game I have fond memories of renting from Blockbuster and playing with my brother when we were younger—nor from being wrapped in warm bedding, but from the feeling of simply not being alone. While I was not actively participating in the live chat, watching the voices of thousands of others rocket by nonetheless gave a sense of togetherness that staring blankly at the ceiling while Stockholm woke up around me never has. However, this experience also changed my perception of communities that I had until then only encountered on a computer while sitting at my desk, when they are in fact portable far beyond what other communities might be. While this realization is perhaps heightened by the explicitly non-physical nature of content, creator, and community—watching a three-dimensional model bobble around while controlling another three-dimensional model while messages only identifiable by a profile image and a username enables a certain suspension of disbelief that might not be quite as apparent if the live streamer or the senders of the messages in the live chat were in some way made more 'real'[42]—it also highlights the fact that digital communities are not only available 'on demand' in a temporal sense, which is to say *when* its members want to participate, as well as in a spatial sense, which is to say *where* its members want to participate.

[42] Ash (2009) has noted that we should not be content with merely understanding all images as one and the same, indicating that while an image is produced by both a film and a video game, for example, the framing of their discursive codes is changed through the unique spatiotemporal conditions of the form of medium used.

This, of course, is neither new nor revolutionary—inundated as we are by advertisements praising the portability of devices and the constant availability of functions and data, it seems a rather quaint observation. However, if it is true that the communities we are more often interacting with are becoming more divorced from physical place, as this participation 'on demand' suggests, then we need to consider the implications of relying on physical proximity as a guarantor of good spatial planning for a society that is increasingly dispersed in digital communities. While the communities that make up HoloMyth are undeniably global, as most things seem to be if they are publicly available on the internet, they nonetheless impact individuals at a local level. The form that this might take varies, certainly, but in this case points to the function of the observed digital communities as support systems that either were unavailable or were not adequate for handling whatever the participants were going through. Further, studying digital communities suggests that temporal understandings of community are both integral to the ways they interact and something that needs to be more thoroughly explored.

4.3.1. Many places at once

Live chat user 33: "Im checking back here while doing other stuff"

While my presentation of geographical dialectics has spent most of its time discussing spaces, it is no less important for us to consider what the place that make up the other half of the dialectical relationship is, how they might look, and how space interacts with it. Indeed, it is this part of the relationship that might be of greatest interest for geographers and planners to understand since, while interface design is ostensibly a job for graphic designers and programmers, it is at its core the creation of places within which people move and interact, find and lose friends, seek experiences both novel and established, and so on. While the type of movement is different in form—you would, for example, be hard-pressed to observe people walking by in a digital landscape when compared with the physical, just as you might be hard-pressed to observe conversational history in as much detail in the physical as when it is presented in a text chat—it does not remove the act of moving. In general, we might understand movement in physical space as a correlation between movement and time, where spatial position is linked to the time it spent being in a place or the time it takes to move somewhere. In this understanding, time can be understood as inevitable, moving forward inexorably whether we do anything or not, and physical movement can be understood as how one's spatial position changes in relation to time, and its potential lengthening or shortening by various forms of locomotion.

However, if we consider movement in the context of molar lines, molecular lines, and lines of flight, we might note that it is not merely physical movement that these lines describe, but a correlation between physical movement and thought: to start along a line of flight is not just to break with the molar movements that surround us, but to break with the molar thoughts that these movements imply. Thus, physical movement is perhaps most fruitfully understood as an intersection of time, spatial position, and thought/memory rather than just as time and position. Just because we are somewhere spatially does not mean that we are not lost in thought, and we can be somewhere in

thought without being there physically. This distinction is particularly important if we consider movement in the digital, which requires our spatial position be in relation to a device and its associated digital infrastructure, but is otherwise unaffected by our spatial position. While the quote makes no mention of what the "other stuff" being done is, the vagueness might also suggest that it does not matter. I can only speak for my own use of a web browser, but it is rare for me to have fewer than 10 tabs open to different landscapes, either things I want to return to, remember to write down, or indeed various digital communities that I want to open. These require physical movements to open, certainly, but the digital, unlike the physical, reduces the temporal distance between these different landscapes and communities by not requiring a change in physical place to do so. As such, while time and spatial position remain correlated in terms of where one physically accesses the digital, digital position more closely aligns with thought/memory as an ephemeral space-unto-itself, bound by temporal linearity but unbound by the requirement that access to landscapes be constricted by the time spent moving through them to reach another. Lines of flight are, in this sense, easy to come by and subsequently pursue in digital geographies.

This simultaneity can be exemplified in the way that conversations are formed within a live stream. Not only are the discussions formed by the video content and live chat as a whole, but these discussions can stretch across multiple platforms that can lead to confusion for some participants while enhancing the sense of camaraderie to those that navigate these multiple places of communication simultaneously (see Figs. 6, 7, and 8). While one it is not necessary to have access to these various places in order to enjoy the live streams or to feel a sense of community, being a part of them enhances the sense of being encompassed in a community since wherever you go digitally[43] there is a reminder of what is going on in that community in various forms. This can to some extent be likened to always being connected with friends or family by a messaging service, but with a greater number of contributors.

Fig. 8 shows the variety of interrelationships between multiple platforms, where the internal interactions on YouTube can produce conversations in what might be considered as a vacuum, but can also be impacted by conversations on platforms outside of YouTube. Where Fig. 7 shows an example of how this was observed to work during a live stream with the use of the platform Twitter, Fig. 8 indicates that the "Other platform(s)" can both be multiple, insofar as more than a single member of the community in question makes use of it in order so it can actually spark a conversation. Of course, the observed community makes use of YouTube as the primary place for communal interaction which implies that there is a difference in importance between one place and another, but this need not be the case for other communities, and it also ignores the temporal question of *when* things take place or geographies become more usable in preference for asking the question of *where* actions take place. Indeed, if we look to Twitter in Fig. 7, we would note that while many participants are evidently aware of goings-on on multiple platforms at the same time, we might suspect that some are only made aware through the notification system in their phone rather than actively watching Twitter up-

[43] And this can be equally true for physical movement if one takes into account wearable symbols of community participation in the form of merchandise.

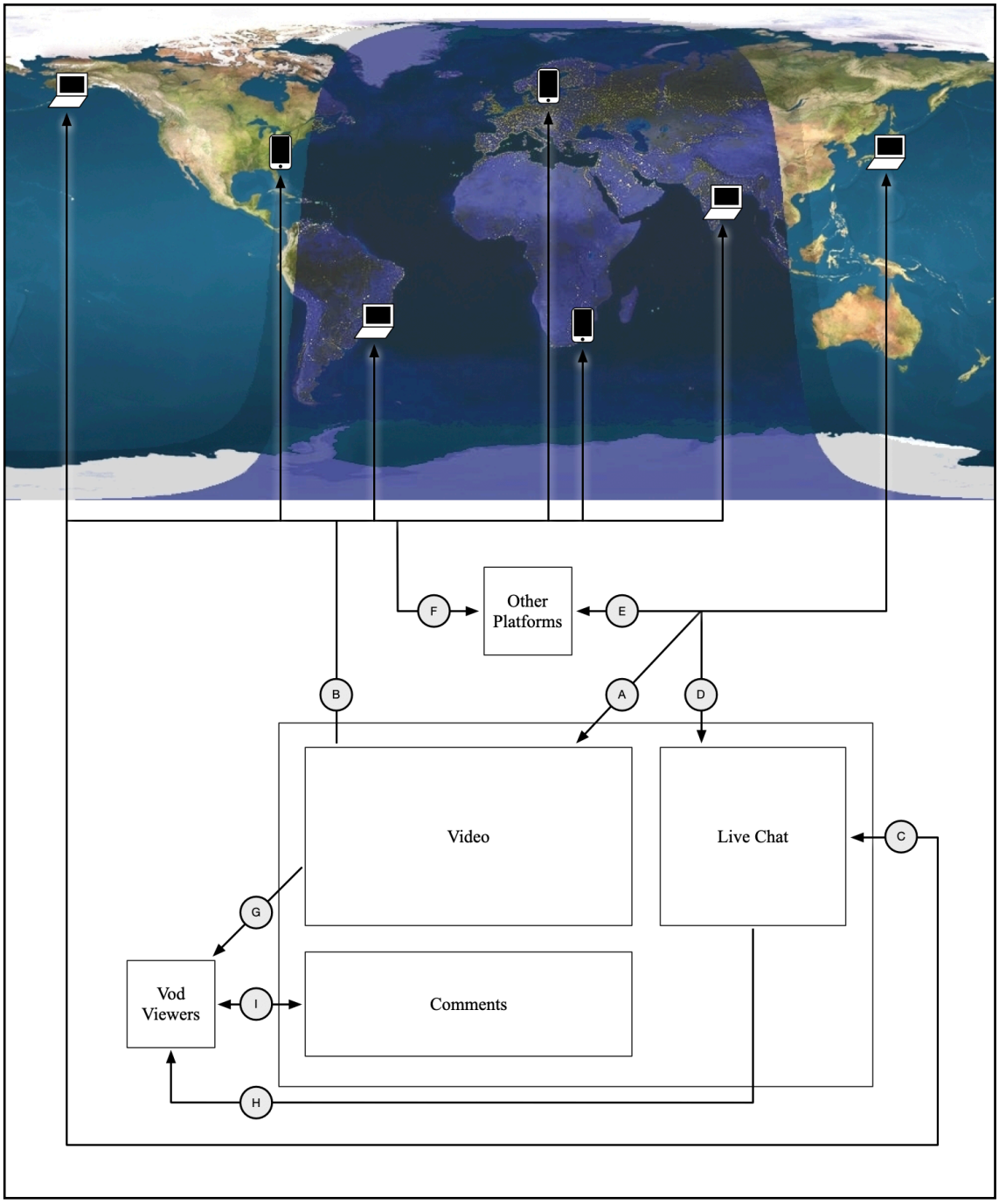

Fig. 6. *An outline of the interactions between the idols and the viewer during and after a live stream where the viewers and idol are represented from potential places and potential times in the world: (A) The idol creates the Video that (B) the viewers watch and then (C) interact with each other and with (D) the idol in the Live Chat which affects the content created in (A). (E) The idol and the (F) live viewers can affect and be affected by things that happen on other platforms, which can affect the content of the live stream Video and Live Chat. (G) Viewing the Video and (H) Live Chat after the stream has ended also allows for (I) community interactions in the Comments section after the fact, but these do not affect the content of the Video itself. Map image: "Daylight Map, nonscientific (2300 UTC).jpg" (Melancholie, 2008) under GNU-FDL and CC-BY-SA, icons and flow chart added to original.*

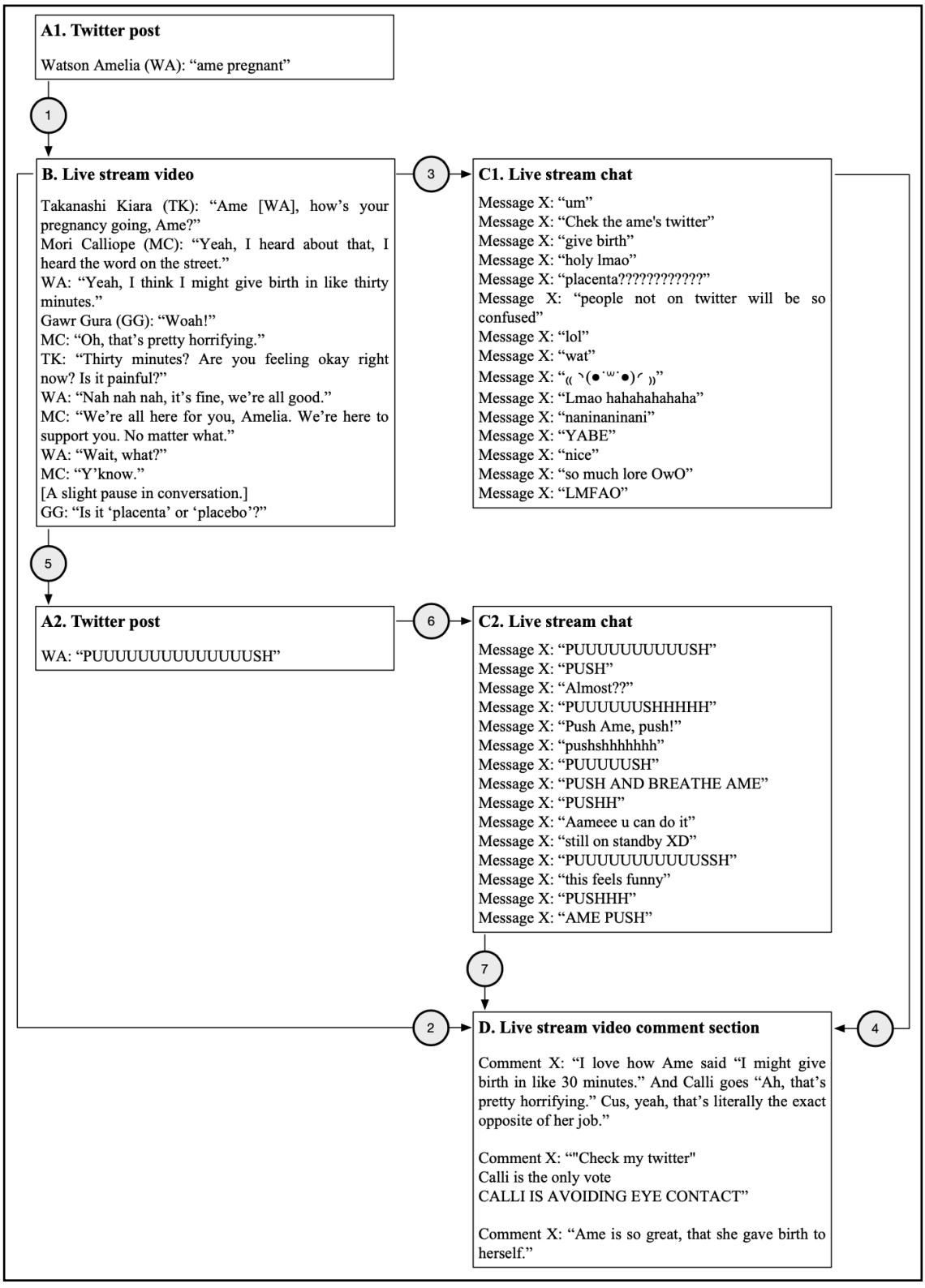

Fig. 7. *How a conversation takes place across different digital landscapes: (A1) A message is posted on Twitter, (B) The Twitter conversation is discussed during a live stream, (C1) The live stream chat responds to the conversation depending on if they have seen the Tweet or not, (A2) A follow-up Tweet is posted in the live stream, (C2) The live stream chat responds without prompting by the idols, (D) The live stream and live stream chat are commented on by people watching the archived video.*

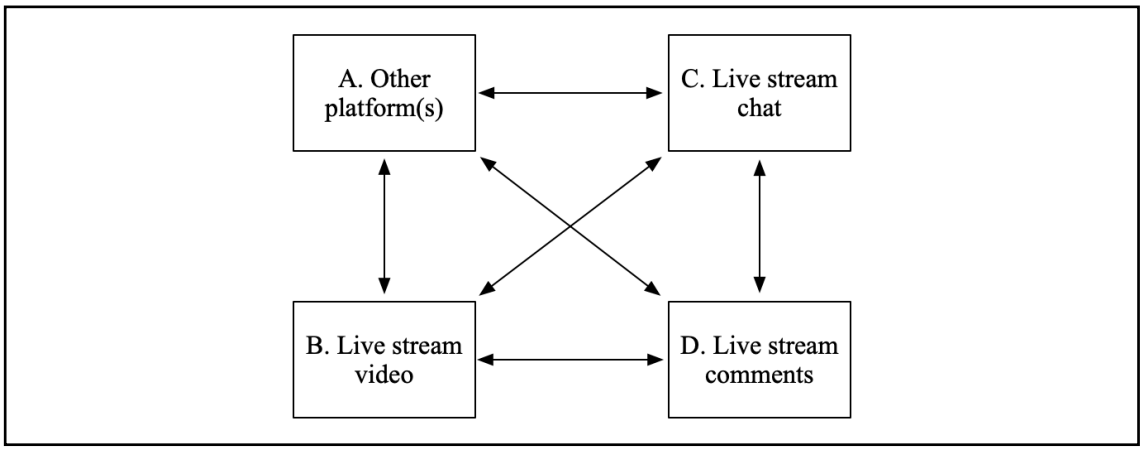

Fig. 8. *A simplified representation of the potential interactions across digital platforms, using the lettering used in Fig. 7.*

date while also intently watching the live stream. As such, we are confronted with how important the selection of a marsh can be when observing digital geographies, not only in the way that it affects our perception of what landscape is seen as 'primary', but also how that choice can affect our ability to perceive how landscapes interact with each other.

4.3.2. Software's spatialization of hardware

Live chat user 34: "Im under my blanket n dont want to leave"

One of the most interesting implications of digital communities, and indeed one of the central questions discussed in this thesis, is that they can not only span multiple digital geographies, but that they span both digital and physical places and that these places impact the experience of the other. In part, this is formed by the accessibility of digital geographies through different forms of hardware, as with the difference between using a computer and a smartphone in the way that they contextualize the digital in the physical (see Fig. 9). I have previously noted how, when waking up in the small hours of the morning, I could access the same community without requiring that I get up and start my computer and instead by picking up the smartphone lying at my bedside. While the quote above does ignore the fact that one is traversing two different places simultaneously, it does, rather humorously, point out the intersection of digital and physical geographies and how the hardware that is used to access digital geographies allows, in turn, for the use of physical geographies to be variable. This asymmetry between the digital and physical is particularly interesting given how the subjective experiences can vary across geographies.

Much like conversation might feel different when dressed in a suit as compared with a conversation dressed in pajamas, interacting with a digital community feels different when fully dressed and seated upright at a work desk as compared with interacting with a digital community wrapped in warm blankets. Observing the communities while seated at the desk where I work, study, and spend my free time makes these actions seem equivalent, inadvertently making the communities seem linked to the actions

I have spent many years in this place. However, by bringing a community into my bed —a place where many of our most private and vulnerable activities take place—the community and the activities related with it become, at least anecdotally, a greater part of our lived realities. An interesting effect is that after quite accidentally stumbling upon a new physical place where I performed my observation, it led to my experienced emotional closeness with the communities increasing, and also moved them closer to my regular patterns of thought. While early on during my observations I would, in a word, dread seeing an upcoming live stream that would occur late at night or early in the morning, after realizing that I could change the physical place where I would interact with the communities I instead started to look forward to live streams taking place at otherwise awkward times because of the recontextualization of space that they allowed, and also suggested to me that I could access the communities in other physical places, such as when sitting on the toilet or while making a cup of tea. It made me perceive the communities as ever-present in my everyday life.

This relationship between geographies is what perhaps bears the most striking resemblance with the dialectic production of geographies that I have used in this thesis to contextualize the relationship between physical and digital geographies. However, the interrelationship between these generalized conceptions of two geographies is interesting because they are both space and place at the same time, meaning that contextualizing the relationship between them simply in terms of the socio-spatial dialectic as proposed by Soja (1980) seems like it would technically be incorrect, and suggests that it might be more beneficial to consider the dialectic between the digital and physical as a dialectic of dialectics. This should not be too great a leap, since, if we are open to the fact that there is a dialectic between the social and the spatial, then it seems reasonable

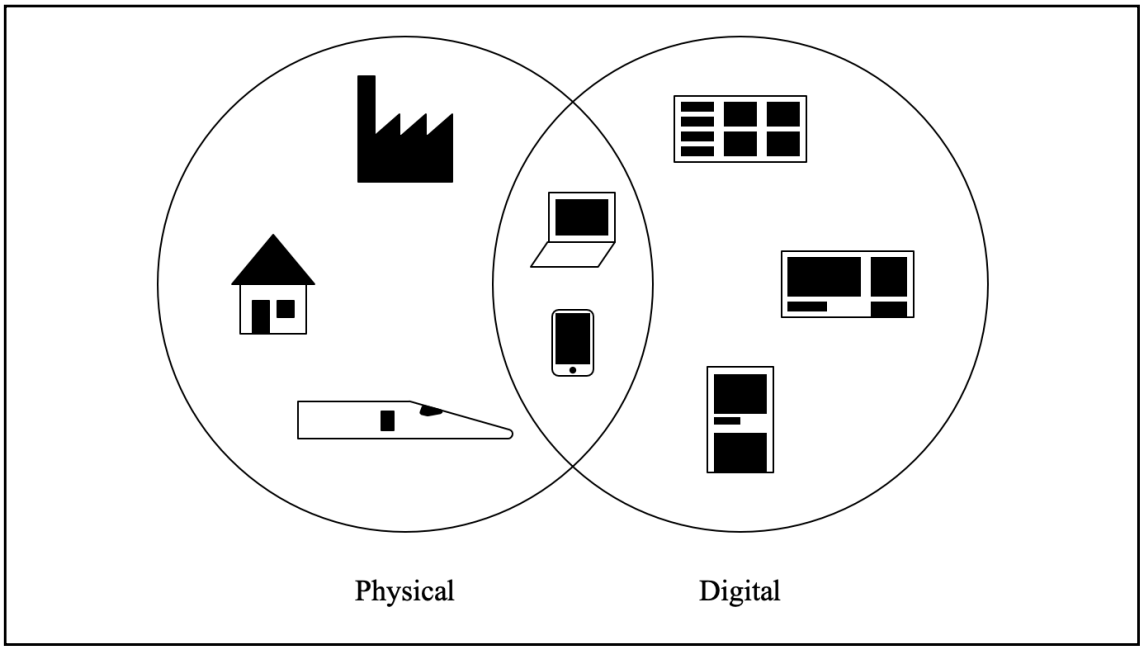

Fig. 9. *A Venn diagram illustrating examples of physical (such as home, work, traveling, etc.) and digital (such as YouTube, Twitter, Facebook, WhatsApp, etc.) places and their related spaces, and how their atmospheres intersect through digital devices.*

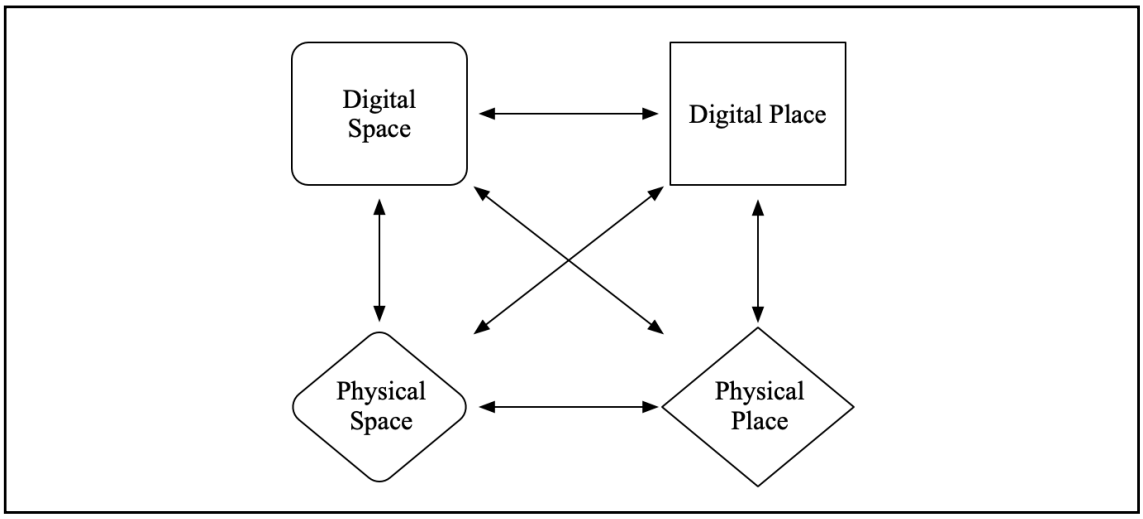

Fig. 10. *The interwoven dialectical relationships of digital and physical socio-spatial geographies.*

to assume that the dialectics for other places can subsequently be intertwined with each other as well. Subsequently, the intertwined nature of dialectical relationships should not be a surprise if we consider the fact that the socio-spatial dialectic is not merely a description of an immediate social or spatial experience, but equally a description of experiences beyond what is immediately apparent.

What this conceptualization of intertwined dialectics does is to provide us with a way of understanding the physical and digital as both parallel to and interconnected with socio-spatial experiences: parallel in that they contain their own social spaces and traversable geographies that are separate from each other, and interconnected in that the social spaces related to their respective geographies contextualize the other and that the geographies themselves require or make possible the existence of the other. This relationship can be observed in Fig. 10 in the way that dialectical relationships are found not just between space and place within a single geography, but across different types of geographies in socio-spatial terms as well as between digital and physical spaces—in terms of how they impact social interactions—and between digital and physical places—in terms of how infrastructures allow the existence of digital geographies and how access to those digital geographies spurs the demand for infrastructures supporting them.

4.3.3. Flight across geographies

> *Live chat user 35: "i just need a place where i can ignore my dark thoughts so im here for tge [*sic*] convo."*
>
> *Observation diary: "Despite myself, I had a viscerally negative reaction when the game was played badly, I couldn't watch anymore and turned the live stream off."*

The result of the interwoven dialectical relationship between different geographies suggests that the lines of flight that can be found in digital and physical geographies,

respectively, can just as easily occur across geographies. The quotes above suggest this phenomenon, where the use of digital geographies are interlinked with experiences in physical geographies, either used as a way to escape from things that happen in the physical or as an instigator of escape back to the physical. The movement between these geographies are fluid, and occurrences in for example digital geographies do not automatically lead to an individual moving into physical geographies. Rather, Fig. 9 can be seen to describe both the multiple dialectical relationships as well as describe multiple lines of becoming between the two geographies that I am concerned with in this thesis. These inter-geographical lines of flight are interesting insofar as they reveal the perceived interrelatedness of the two geographies, as well as highlighting their separateness, by creating the potential to clearly break with actions in one geography by making use of another.

Much like someone might meet with friends so that the conversation can push unwanted thoughts to the back of their mind, or someone might leave a room to escape feelings of discomfort or disgust, the relationship between using physical and digital geographies create spaces of retreat for the other. While the inherent geographical differences between the two are what makes the speed of these changes possible, it is not these differences that are the reason for them being chosen. Rather, it seems like the decision to escape one geography for another is an attempt to find the most obvious answer to the problem. In context of the former quote, the global nature of these communities means that one can almost always find someone to talk to or watch with, regardless of when one might need it and regardless of whether the friends one might have physically are asleep or awake. We might also want to consider that some conditions leading to such "dark thoughts" might make it difficult or impossible for physical meetings to take place. If we then consider the latter quote, to turn off the live stream or phone immediately puts an end to the feeling of discomfort just like leaving a room would. Certainly, turning off a live stream does not necessarily mean that one leaves the digital since it is quite possible to go to another part of the same website or to an entirely different website. However, escaping entirely from the digital is always a possibility, dependent on the situational needs of the individual.

5. Discussion

At the start of this thesis I asked three questions that need to be returned to in order to contextualize the findings that have been brought up thus far and to find a way forward for planning and geography to study and learn from the intersection between the physical and the digital communities:

1. In what ways are digital spaces simultaneously material and immaterial?
2. How can we understand and conceptualize the spatialities of digital communal spaces?
3. What lessons can spatial planners and geographers learn from understanding what contemporary online communities look like?

I will answer these questions in the order that the questions above are asked in the following sections. The final question has been divided into two sections, one being focused on the question of academic form while the other will discuss what planners and geographers might find useful in their future practices.

5.1. Digital spaces are both material and immaterial

Digital spaces are made relationally between material and immaterial practices through hardware but also through embodied actions and emotions. During my observations, it became clear how important the physical world is when contextualizing communities in digital space. Digital communities are immaterial, but are always positioned within the physical places we are in or travel through, mediated by physical screens and hardware, and carried as imperceptible data packets sent through routers and along cables. So while these digital experiences are presented as immaterial and fleeting, the spaces that they contain are made material in our physical interactions with how it is displayed. Our eyes skitter across the screen seeking the next thing to see, our fingers dance on the keyboard to respond to a message, and our hearts beat faster or slower as suggested by what is happening on the screen. Maybe something creates a feeling of revulsion in us, and we click away immediately; or perhaps we become intensely curious and cannot help but investigate. As Ash (2009) has suggested, what appears on the screen is not in and of itself immaterial when judged by how it affects us, but it is worth noting that the interactions we have with these screens—whether they be interactions with others as I have described in this thesis or the interactions with digital worlds of video games or websites—do create immaterial social spaces that exist with dialectical relationships to the places that surround us and are, in turn, affected by these places.

Neither are immaterial spaces devoid of emotional or physical reactions. During one pre-chat, a prolonged discussion of sexual preferences created a physical sense of discomfort inside me that seemed, from the multiple messages trying to waylay the conversation, equally palpable to others in the pre-chat. Although a short-lived atmospheric interlude in a meandering pre-chat conversation, it reveals that the experience of digital space can manifest in the physical body and as ways of acting in the physical

world, as well as shows us the dialectical relationship between the digital and the physical. Further, social spaces traverse the digital and the physical by way of our memories and through our interactions with the other environments we occupy. In conversation, we can bring up something that happened while watching a live stream or we can dress ourselves in merchandise that proclaims our fan affiliations. These are simple things, certainly, but they in turn change the perception of the body in place. The material and immaterial are also temporal— within the space with its practices and routines, in physical environment in which digital is situated, and the ways they relate to each other.

Proprioceptive spaces become most useful where the material and immaterial intersect, since we feel our bodies being in-tune with the atmosphere around us when our actions are aligned with what our experience of the space seems to demand. Lurking, much like observing the goings-on in the physical world, is a digital form of orientation in space, allowing someone to observe how to behave without revealing oneself. Observing in this way allows one to learn the rituals as they are performed, to plan the movements that will be attempted, and to reflect on how they will feel. Once one has rehearsed how the act of doing might feel, then the act of doing itself becomes less strange. It is this sense of comfort in the *act of doing*, the sense of knowing that an action that is performed is accepted by others and feels right to the self, where proprioceptive space can be understood to create a shared space of infra-ordinary actions. It is certainly the case that it can be enjoyable to knowingly break the norms of a place, but it seems that we must internalize the spatial actions of a *place* to feel like we belong in its *space*. Of course, dialectic thought suggests to us that this is a never-ending process of back and forth.

5.2. Conceptualizing the spatialities of digital communities

It is in the meeting place between physical and digital where we have to come to grips with the dialectical fact that the material and immaterial cannot exist without the other, and that the immateriality of what we experience is a magic trick of sorts that convinces us that information no longer needs to be physical while requiring greater and greater amounts of land and resources in order to store it for us (A. Taylor, 2018). While it is important to understand that the digital is underpinned by the material in this way, and will be returned to a little later, it must be noted that the digital and the physical are much more complex than the dialectics between each other; they are also relational, affected by the spaces and places that exist within them. As with any other type of group, digital communities are filled with many different people with different thoughts, experiences, and goals, compounded by the possibility for digital communities to span multiple platforms. The process of learning these nuances takes time, and I doubt that I uncovered all of the various nooks and crannies where the HoloMyth communities commune. This informational asymmetry between community members leads to different potentials for interacting with the community at large since every platform necessarily constricts forms of interaction, both in terms of what can be said and how it can be communicated.

However, the constriction of communication also impacts the socio-temporal proximity to the communities they contain, bringing us close to them while simultane-

ously splitting our attention between many different avenues of potential information. We might make use of Landsberg's (2004) suggestion that mass communications have created 'prosthetic memories', describing experiences that are now accessible to anyone regardless of their underlying claim to those memories. Having an ever-accessible mass of memories also changes the way that we individually approach having memories, however. If we are lost, we do not merely open the map application on our smartphone and hope; we are certain that it will show us where we are and become discouraged, perhaps even frightened, the few times it cannot. We do not need to remember where we are going, because we can outsource those mental processes to something outside us. Digital communities can also be used like this, allowing us the comfort of always having a community with us to escape into as and when it is felt necessary, although it needs to be emphasized that what might be termed 'prosthetic communities' are not any less meaningful once they are adopted and internalized as an 'emotional possession' (*ibid.*, 2004).

These feelings are in turn compounded by the ability to access digital communities almost anywhere. As much as we rely on applications to mediate our experience of the physical world, we are evermore reliant on the constant access to communities wherever and whenever we are. While I have looked at this communal access in terms of VTubers in this thesis, it is equally relevant to consider the many platforms used in our everyday lives to communicate with friends and family. It is not unreasonable to assume that we talk over Facebook, whether as social media, its eponymous messaging system or, indeed, through the Facebook-owned WhatsApp, that we watch and share media on Twitter, watch YouTube videos, and answer SMS messages on our phone with many of the same people, and that we discuss these shared media experiences over a Zoom call. Undressed of its virtual spectacle, these are infra-ordinary actions that we engage in every day without a second thought.

5.3. Academic form and presentation in digital research

An unintended result of writing this thesis is that the presentation of results, despite being gathered, written, and eventually transferred digitally, must nonetheless be presented as text formatted for print. This limitation of presentation was most obvious in trying to represent the experience of travelling along digital lines of becoming as well as the lines of becoming themselves, the feeling of being inundated with a mass of messages and information, and the intermittent sense of spatial dislocation while navigating through digital geographies. While I by no means intend to disparage the form—I find the task of solving problems within restrictions to be interesting, and that there is something admirable in preserving molar publishing—it is arguably a restriction founded in familiarity rather than necessity. Given a contemporary assumption of technological access and literacy, as well as the digital nature of distribution, there is potential to explore new ways of presenting academic findings beyond text and still images within the technological capabilities we now possess. While not applicable in all cases—the static form of articles and books is far from dead and will likely retain its hegemony for a long time to come—allowing for the use of file types like GIF images, MP3 audio recordings, or

MP4 video recordings (among many other file formats) would potentially allow us to more accurately present what the places and spaces we intend to explain are like.

Beyond the form of the data that is presented, the results presented in this thesis might teach us about the usefulness of ethnographic observation and autoethnography as a method for exploring digital geographies. Clearly, the choice of method provided access to many digital places that might otherwise be inaccessible if we were to make use of other methods available currently to researchers, but has likewise made other forms of potential knowledge unavailable. While I have discussed the complexity of communities that exist in digital geographies at length, it is just as important to note that because digital geographies are constantly carried with us means that they in turn add another layer of both geographic and socio-temporal complexity to the physical geographies we study. If we are to perform an urban observation of a plaza, for instance, then it may no longer be enough to simply observe the plaza and the physical movements and interactions that take place since this would only concern one of the geographies that are present. Indeed, it is the multiplicity of personal reflections on how and why one shifts between digital and physical geographies that my observations have been unable to reveal, and which Richardson and Lindgren (2017) have suggested are undervalued as objects of study as compared to the spectacle of the technology itself.

5.4. Lessons for geographers and planners

Central to the arguments found in this thesis is the idea of digital geographies being complex: with complex internal spaces and places catering to any number of needs and desires, and made even more so by their relationship with how people move between digital and physical geographies. While digital communities may be immaterial in nature, it does not mean that they should be considered as any less important to those that make use of them, or in their role as everyday landscapes. However, it has also highlighted the need to understand the motivations behind why these communities exist, how the navigational complexity that participating in disparate digital landscapes is understood by those using them, and the effects that participation can have if we are to truly understand how digital geographies impact the physical world. Indeed, I have in my choice of method been unable to fully grasp how participants perceive, understand, and navigate the communities they are a part of and, while many messages, posts, and comments made note of how the community as a whole and the idols in particular had had a profound effect on their lives and self-esteem, this does not reveal in what ways this experience has in turn affected their interactions in the other geographies they exist in.

My observations have also suggested that it is not unusual for small, more intimate sub-groups to form within these communities, often making use of a different digital landscape than the larger community that better accommodates their local needs, and

there are many lessons for making digital places or communities[44] to be found in the exceptionally supportive nature of the HoloMyth communities.

This heterogeneity can be problematic for planners, policy makers, and academics seeking responses from certain types of participants since many of these smaller groupings can take place behind closed doors rather than in public space, which should be kept in mind when soliciting information from participants in public digital settings. This further suggests that the use of or need for different platforms should be taken into consideration so that individuals can join discussions in ways that allow them to present data using tools that they want, need, or are able to use. Likewise, it suggests that we are at risk to "create the *public*", and in so doing destroy the individual in the creation of a public that did not previously exist (Bauwens et al., 2019: 415).

Even if this type of online design is not adopted, the simple realization that just because something is public on the internet does not mean that it is readily accessible or discoverable by those in need is important. This is compounded by its relationship with an algorithm that, although not sentient, has a great impact on how an individual perceives the landscape. An interesting way to contextualize this is in terms of the visibility of a community and its participants. While public accessibility is important when discussing the ethical concerns related to research methods, it also tangents questions of access by planners and politicians and to what extent the information they find can be extrapolated beyond the group and its opinions, something Ananthaswamy (2011) has noted with the increasingly fractured nature of the 'splinternet'. This is important to consider when landscapes dominated by algorithms make the accurate delivery of information inherently difficult, suggesting that regulation of digital distribution services might be necessary in order for important announcements to find their way to those in need, irregardless of the viscosity of an individual's algorithmic choices. While HoloMyth is unlikely to be the foremost avenue for local planning knowledge given its inherent and globalized virtuality, the point remains that if discoverability is not guaranteed, then the information can be assumed to be skewed in some way, whether that be from the population that makes up the community being observed or based on something as fickle as capturing someone's attention (Himelboim, 2011).

Beyond this, the relationship between individual and algorithm is a subject that is worth exploring in more depth, both in terms of how a human-machine relationship is formed and what the perceived interactions we have with an ephemeral landscape might teach us about our relationships with the changing physical environments that surround us. Indeed, while it might be easy to conceive of physical landscapes as static and containing movement, it should be remembered that we are surrounded by similarly opaque ecosystems that are equally impacted by our choices as an algorithm is, albeit do not present the results of these choices in a scrollable list of thumbnails catering to our whims and fancies. Taken another way, studying this relationship might also teach us

[44] While the likeness between creating digital places could use the term 'digital placemaking' in order to distinguish it from an 'analog' placemaking, Halegoua (2020) has made use of the term to instead refer to placemaking done with digital tools. This is an important understanding since the contemporary planner's obligations are to physical places and the people there, but it seems to suggest the primacy of one place over another to the detriment of both.

what we expect from the various machines that we are trying to imitate life, and what looking in the mirror of our creations might teach us about ourselves.

The presumption of multiple geographies that I have used in this thesis can, of course, be interpreted as an assumption that this form of accessibility is inherent in all physical places, and might reveal an underlying assumption of technological accessibility that comes from living in both a major urban center and in the developed Global North. However, given that digital geographies are, in the words of Krisch and Plank (2019: 16), "foundational for the functioning of our economy and society" and subsequently are assumed to always be 'just there'—for finding social camaraderie as has been explored in this thesis, for the businessperson telecommuting across town or across continents, or for those just holding on to one's sanity in self-quarantine—it seems all the more relevant to consider the unevenness of digital infrastructural density in terms of the individual's access to public space; perhaps as a, to borrow the words of esteemed minds that have come before, 'right to the digital'.

While I have shown that the digital is a complex geography in and of itself, made only more complex by its interrelatedness with physical geographies, I have done no more than scratch the surface of what it means that these geographical landscapes are almost entirely dominated by corporate interests. Certainly, many people use the services that corporations provide and doubtlessly many have positive interactions on or with them, but at the end of the day they are no more public than a shopping mall where one's interactions are governed by the sometimes arbitrary decisions of a corporation, or the algorithms they might use to make those decisions more efficient. The potential answers are many: regulation may be the best option, or it may be preferable to create digital facsimiles of town squares that are lined by corporate storefronts, but not governed by them. Regardless of the way forward, it is in the criticism of corporate spatial dominance where I think the most meaningful application of geographic thought in digital geographies can be found.

6. Conclusion

I have in this thesis explored the relationship between physical and digital spaces through the phenomenon of HoloMyth live streams and found that the relationship is formed by both the socio-spatial dialectics that exists in the digital and physical, respectively, and the interrelated digital-physical dialectics that exist between space and place. These dialectical relationships reduce the socio-temporal distance between individuals around the globe, not by making them closer in the physical world, but by reducing the perceived distance through the social relationship mediated by the digital world. Indeed, drawing on the concepts of atmospheres and desire lines has shown that claiming a clear delineation between the digital and physical might not be accurate, and that the dialectical relationships between these geographies makes such clear distinctions much more opaque. The global nature of the HoloMyth communities highlights this, both in terms of the geographical distribution of participants as well as the perceived temporal distribution of participants across time zones. As a result, the question is not just where communities are being engaged from, although this is an important consideration at both micro and macro levels, but also when the communities are accessed and engaged with.

Further, I have shown that digital geographies themselves are much more complex than might have been previously thought, consisting of their own social norms and ritualized actions, but both contain smaller sub-groups and are part of larger communities, each with their own emotional and technical needs and desire different forms of interaction that align with their own social norms and require different ways of communicating that, in turn, informs the other groups they are nonetheless intimately related to.

The implications of this are twofold. The first implication is that the body of literature suggesting that the technical needs of platforms needs to grow with their communities and offer technical solutions to all problems does not, and perhaps cannot, account for the needs of all parts of the community, and, further, that this does not seem to be an issue. Indeed, it seems like there is an abundance of digital places where these groups can find the various tools or forms of presentation that they need. The second implication is that seeking out communities and getting their feedback is not as simple as just finding the most central place they gather and asking questions. Many voices that are silent in these central places are louder on other platforms and in smaller groups, and this needs to be taken into account so that digital communities are not considered as monolithic structures. This has long been the domain of ethnographic and anthropologic study in the physical world, but it is equally applicable to observing the digital.

But, perhaps the most important takeaway from this thesis should be that while there exists a persistent sense in the literature and perhaps even at a societal level that the digital is still something exceptional and spectacular, the world we live in now is just as digital as it is physical. From the way that we entertain ourselves, pay our bills, and, indeed, find and mediate social interactions, it is clear that physical geographies constantly intersect with digital geographies. We are now more than ever in need of approaching the digital as something mundane—for so long as we do not, we risk thinking that the internet is both universally accessible and a necessary luxury.

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