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Understanding "Zoom fatigue": Theorizing spatial dynamics as third skins in computer-mediated communication

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Abstract

"Zoom fatigue"—theorized here as part of a larger experience with computer-mediated communication (CMC) exhaustion—has emerged as a common negative experience through prolonged use of CMC platforms. Despite CMC exhaustion's ubiquity, the relatively novel phenomenon has caused much speculation for its root causes with little information pinpointing why it occurs. Utilizing research, observations, and personal accounts, this article explores synchronous online consultations (SOCs) within writing centers as matching sites to ponder the basis for CMC exhaustion. In doing so, third skins are proposed to account for how nuanced differences in space between SOCs and face-to-face exchanges mean participants are not engaged as human actors but "flattened" into a totality of third skin comprising person, background, and technology. The resulting transformation and our bodies exerting substantial cognitive efforts to interact with this transformation are theorized to produce CMC exhaustion. The implications for this are twofold: 1) for readers interested in the underlying causes of CMC exhaustion, this work presents a framework to test the ideas proposed and develop mitigating strategies, and 2) for readers who study SOCs, third skins might explain previously observed limitations in the effectiveness of visuality in CMC.

Keywords: CMC exhaustion; Synchronous online consultations; Writing; centers; Theory; Third skins; Space; Actor Network Theory; COVID-19

1. The rise of computer-mediated communication exhaustion

I write this article several months into a global pandemic that has transfigured life as virtually all people have known it. Aside from my weekly, one-hour trip to purchase groceries, I never leave my house. But I have been lucky. My loved ones and I all have our health. Our jobs too. While my partner does venture to campus to keep fly colonies alive for the laboratory he runs, I have shifted all my duties online: teaching, workshops, administration, service, and consultations. Rarely were these efforts virtual prior to the pandemic, but now I cannot spend more than an hour away from an e-mail or a Zoom meeting.

Though I am writing this in my Now, I am imagining a future where you, Reader, are in a different place. A world I hope not locked down—for one. But also a world transformed by the experiences such as the ones I briefly outlined.

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While synchronous and asynchronous interactions—be they instruction, writing center consultations, or departmental meetings—were long an element of education prior to the pandemic, they were not practiced by the majority at most institutions—and certainly not as a majority of work. Many of us toyed with what it might be like to teach a course online—perhaps motivated by a dean's words about distance education being part of a program's future. But then *it* happened, and every element that could switch to a virtual format did. But Reader, several years from my Now, I suspect this will be looked back on as an important moment in education. For this grand experiment in education's shift to virtual formats feels (in my Now) like opening Pandora's box. Any attempt to return to "normal" will be challenged by the shared knowledge that there are other ways to do our work.

One reason that the switch to virtual contexts cannot be ubiquitous, however, is that we are discovering limitations to what the virtual can replicate. I do not mean this in the obvious, e.g., how laboratory sections associated with STEM coursework require physical learning. No, I am referring to the ramifications that arise from shifts in physical to virtual environments. I argue that we all likely have experienced the core of this phenomenon: that something feels different when communicating in computer-mediated communication (CMC) contexts compared to face-to-face (FtF[1]) exchanges. And this occurred long before COVID-19. Personally, there has always been an ineffable difference when I Skype with my in-laws versus my calling out to my partner from the kitchen when he is in another room. Though I can see and hear my in-laws, they feel so much further from me than my partner, whom I cannot see (or tell hears me), in a nearby room.

The premise of audio-visual technology (AVT) in CMC is that it heightens exchanges by capturing communication nuances such as body language and tone. But if seeing and hearing another person does not fully capture the experience of FtF exchanges, that means something else accounts for the difference. Of course, the obvious element is physicality—when you feel someone interacting with you. But as my partner in a different room illustrates, presence is not necessarily physical: it is spatial. When we interact in AVT-assisted CMC, something spatially shifts in technological mediation from an FtF exchange. But what? And how? In my Now, the biggest example of this is what we call "Zoom fatigue." This umbrella term serves as a pan-descriptor for the symptoms people experience after prolonged technology use—typically CMC platforms with AVT. While many report varying issues, the general cost is exhaustion (both physical and mental). That is, interactions that normally do not tire people when conducted in FtF contexts now deplete people when these same interactions occur virtually.

Zoom fatigue, which I want to rename CMC exhaustion to capture the myriad platforms that cause this experience, is not merely the result of staring at a computer screen for too long; otherwise, we would have heard of Facebook fatigue long ago. It is the effect, I argue, of complex interactions that I theorize as a third skin, which due to spatial dynamics in CMC alters how people engage interactions in virtual contexts. And though my Now is currently still trying to learn more about this condition, I would not be surprised, Reader, if in your Now there are new challenges associated with virtual interactions. This is because, try as we might, virtual interactions do not and cannot replicate FtF ones as our bodies are primed to experience. Which is to say that whether it is my current form of CMC exhaustion or your novel one, we cannot mitigate these impediments to virtual interactions until we understand, on a theoretical level, how they are arising.

This article will think through this occurrence aloud to generate a framework. And it will do so with a specific context—synchronous online consultations (SOCs) within writing centers (WCs). And in that thinking, I raise more questions than answers. Which is to say this work is not meant to be the definitive take on why these conditions arise but a conversation premised on experience that may illuminate mechanisms we do not yet understand. And why SOCs and WCs? Because they serve as generalizable experiences that have been routine for years. That is, while many educators (and beyond) have recently found themselves shifted to a virtual context, SOCs have been occupying this world for quite some time. WCs have literature, data, and anecdotes devoted to these experiences. Additionally, the one-on-one intimacy of SOCs makes them a better proxy for the interactions that most people are experiencing than online classroom experiences because SOCs are more dynamic and less hierarchical in their interactions between parties. But I also want to extend an invitation for all readers—be they workers in WCs, instructors, or administrators, folks in composition studies or engineering—to draw on third skins and WC work with SOCs beyond the immediately discussed context. Any synchronous CMC interaction—from teaching to job interviews, lab meetings to virtual happy

[1] Literature also refers to this as f2f or F2F (most common, from my perspective, in writing studies). In the social sciences, however, it often takes the FtF form, which I am utilizing here due to the social science theory tradition of this work.

hours—shifts spatial engagements based on how our physical bodies are predicated to exist in these situations. By understanding the context for how this occurs, the theory of third skins may allow for any user of synchronous CMC to better coexist with the medium.

2. The need for SOC-specific theory and why we should be looking at space

Before CMC exhaustion and COVID-19, my work in WCs had already made me aware of the differences between FtF and virtual interactions. Several years ago, I participated in a SOC as the consultant for our university's WC. It began as many others; after setting up the consultation's goals with the student author, I informed her that I would "disappear" for the next five minutes while I read through her text. When I finished, I began summarizing my experience—for about ten seconds. That is how long it took me to notice the student had vanished from the consultation. Her video feed was still streaming, but no one occupied its frame. I waited for the next few minutes until she returned with a glass of water—apologizing as she had not calculated I would be done with the text so quickly. And what if I had been a slower reader? Likely, I would have never noticed her brief departure.

This is but one of many such "encounters" over the decade of my using SOCs: moments where something occurs that have left me unsettled. To be clear, the student leaving our consultation was not the issue. Rather, it was her doing so without my knowing. On its own, such an event does not seem odd, but I kept comparing the interaction to FtF consultations. Never had a student "sneaked" away in my physical presence. The fact that she had—without it changing my behavior whatsoever until I noticed—weighed on me. That is, something about the SOC environment itself structured the consultation in a way that made it *feel* different than an FtF consultation.

Aside from my own experiences, this feeling (and its possible outcomes) occurs in various WC contexts. For example, under the section analyzing its SOC efforts, the annual report for the University of Georgia Writing Centers states,

> Though the increased number of sessions means the Writing Center served more students this year, consultants who have worked these hours report that sessions conducted online are less productive and satisfying than sessions taking place in person. Specifically, several consultants report clients utilizing these online sessions seem more insistent and intent upon using the Writing Center as an editing service. (Rawlins, 2019)

Implicit is that these students do not utilize this WC's FtF consultations as an editing service. That is, something, again, about SOCs changes how participants interact with the consultation itself. And WCs are not alone in this observation; for example, Maureen Hannay and Tracy Newvine's (2006) work looking at traditional vs e-classes too found that students largely embrace digital spaces in ways that diverge from the experiences of those teaching them. While seemingly divorced from conversations on CMC exhaustion, these observations are important because they showcase behavioral changes and emotional experiences when the same action is shifted from a FtF to a virtual context.

Given that this difference seems fundamental to understanding differences between SOC and FtF consultations, I expect it to be entrenched in WC pedagogy. But if one flips through *The Bedford Guide for Writing Tutors* (2015), one will notice that attention to writing consultations in any non-FtF form is small. There is a chapter devoted to "Tutoring in the Information Age"; however, it spans all of seven pages when describing online tutoring. Moreover, the SOC section is a paragraph-long description comprising four types of SOC (e.g., chat box and streaming technologies). All that is mentioned is what these platforms entail. *Not* what makes them pedagogically different. *Not* why SOCs differ from FtF or asynchronous online consultations (AOCs). Rather, the text directs us that in "[t]hroughout the other chapters of this book, we have included examples of [SOCs]. Indeed, because of the commonplace availability of real time platforms and applications, strategies and considerations for in-person tutoring translate quite seamlessly into [SOCs]" (Leigh and Zimmerelli, pp. 90).

Taking this logic at its core, this would imply that, everything from traditional classes and e-classes to traditional doctor visits and telemedicine, FtF and virtual contexts are largely the same if the necessary AVT exist to simulate reality. But we know, both anecdotally and from research, that replicating physical WC interactions in virtual contexts produces different outcomes (c.f., Jackson, 2000). This is also to say that there seems to be a mystery: despite decades use of SOCs, I cannot seem to pinpoint prominent discussions of CMC exhaustion. So why would a guide utilized to train WC consultants offer this advice, and how has the field in its many years overlooked a phenomenon that arose only weeks into mass user experience?

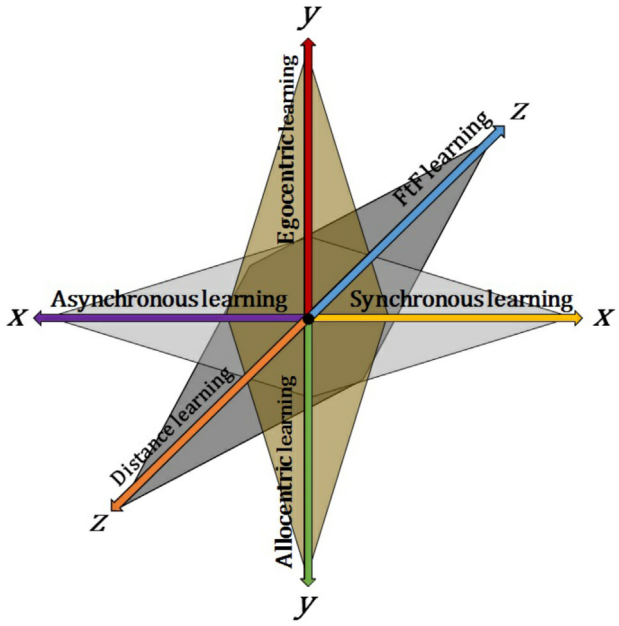

Fig. 1. XYZ axes graphing planes of intimacy. The x-axis concerns time-based learning considerations ("positive" interactions are synchronous while "negative" interactions are asynchronous); the y-axis concerns direction-focused learning considerations ("positive" interactions are egocentric while "negative" interactions are allocentric); and the z-axis concerns proximity-based learning considerations ("positive" interactions are FtF while "negative" interactions are distance). The 2 choose 1 nature of each axis (independently) allows for 8 possible octants (i.e., 2^3).

While there are many complex answers to this question, I would begin with the fact that SOCs themselves are not comparatively well studied compared to their FtF counterparts—and WC scholarship in general is smaller compared to composition studies centering on the post-secondary classroom experience (Prince, Willard, Zamarripa, & Sharkey-Smith, 2018). This is particularly striking given that the *St. Martin's Sourcebook for Writing Tutors* acknowledges that,

> [O]nline tutorials were and are taking place at an alarming rate considering the lack of research. We haven't determined how the service is being accepted by student writers and tutors or how the tutoring process itself is being altered by online mediums. . .Clearly, we lack an understanding of what we are doing when we take WC work online. (Bell, 2011, p 327).

I would modify Lisa Eastmond Bell's concerns in that it is not that we lack understanding of what we are doing but that we lack knowledge of *why* things occur. And in this case, CMC exhaustion and space's role in our online work.

While SOC scholarship may be undersized, the experiences that exist in the field are many. And these experiences are essential because people (in my Now) entering conversations about CMC exhaustion may be doing so as novices to CMC experiences. As long-time CMC practitioners, SOC users possess valuable insight into the context—which is why space leaps out at me as the smoking gun in this exploration.

A key tenet to SOC scholarship is that *SOCs are not X*. As in SOCs are not FtF consultations or AOCs. Nor are they stand-ins for the work done in traditional or e-classes. The general agreement is that SOCs are their own entity imbued with properties that require a specialized training and pedagogy—which is to say that our FtF lectures delivered asynchronously, our FtF meetings conducted with Zoom are not mere simulacra but hyperrealities in their own right (Baudrillard, 1994). And through my years of reflecting what makes the SOC CMC environment distinct from other communication contexts, I have generated a model that allows people to plot their interactions on an x-y-z plane of intimacy. That is, I model the basis for the felt changes between FtF interactions and CMC, which allows us to pinpoint the origin of CMC exhaustion.

This model presents three intimacy considerations that produce eight possible representations (see Fig. 1 below). Intimacy here reflects how proximate the consideration is to the influenced party. The x-axis concerns the physical spatial considerations (e.g., is the learning activity occurring in person?). Borrowing from spatial processing ter-

minology, the y-axis reflects the learning perspective (e.g., does the student see the learning activity as originating in his/her/themselves?). The z-axis considers time (e.g., are all parties in the learning activity participating simultaneously?). Thus, the ideal learning activity is one that privileges FtF interaction through egocentric learning in a synchronous environment, or in other words, a FtF consultation. In this light, we can see that SOCs match two of the three positive intimacy considerations—differing only in the spatial consideration. It is for this reason that I argue that spatial considerations are more than a point of interest but should be the focus of theory and pedagogy specific to CMC exhaustion and more broadly to SOCs.

I build from this point in the following section through observations and literature to scaffold various elements of third skins and components of CMC exhaustion. This work is sequential and collectively accounts for theorization. For each element, know that I divide my discussion into two pieces. The first introduces the element being theorized. Long-time readers of *Computers and Composition* are likely familiar with many of the elements introduced, which in that case feel free to jump to the second piece positioning the element within the framework of third skins. But if you, Reader, are new to any of these concepts (and welcome!), the first piece will serve as an explanation replete with examples and metaphors to help orient you to the applied nature of the second piece.

2.1. Element 1. Technology is an agent that influences akin to how people do

As the name suggests, something about CMC causes CMC exhaustion because if the primary difference between FtF interactions and SOCs is medium, then the medium itself is likely responsible. Thus, I want to begin with media as entities capable of manipulating space. That is, I want to move past the premise of *People respond to technology*, which promotes technology as a passive influence, and conceive of technology as an active wielder of force. *Technology causes people to behave*.

In this light, technology is like any object interacting with gravity: it does not matter whether that object is alive for its mass is chiefly responsible for how much force it exerts onto anything in its presence. I am reminded of a middle school science lesson when my teacher informed the class that a thimble-sized event horizon of a black hole contains the same mass as the entire Earth! And in our case of technology's "gravitational" influence on users, mass can be thought of as how much "force" we devote to interacting with an object. Each element in a SOC (e.g., a video screen, a whiteboard, a chat box) pulls energy (physical, cognitive, and emotional) from the user for engagement. This is why the energy invested in a SOC can be far greater than a parallel FtF exchange. For example, reading someone's body language is hard enough, but it has been suggested that when you only have a face to draw cues from, the cognitive effort exerted is increased due to diminished nonverbal cues (Wiederhold, 2020).

But how can an inanimate medium demand so much from a living thing? It is essential to realize that when theorizing virtual spaces, people behave differently when engaging a digital medium than they would when performing the same action within an FtF context (Cover, 2012). Though there are many ways to employ and assess Bruno Latour's theory, this article embraces (and limits) Actor Network Theory (ANT; Latour, 2005) to a key tenet that human and nonhuman actors (e.g., objects and ideas) hold equal agency in generating network assemblages. Such is why a printed book versus an electronic one can stir different reactions in people despite the texts being "identical" (Kimball, 1997).

In not privileging how humans interact with nonhuman actors and vice versa, ANT establishes a mechanism for viewing relationships within a network between human and nonhuman actants (see Fig. 2 below). This is key in a conversation concerning CMC exhaustion because ANT compels us to realize that the media we use in our relationships with people influence those very relationships. For example, on a very practical end, if one's computer is not working, then consider the Zoom meeting you planned to hold—and the human relationships to be cultivated in it—canceled. But this is true in a deeper sense too. Think of how a YouTube or Instagram account can curate an identity residing entirely within a virtual realm. These platforms not only host these virtual lives but also actively mold them through the social mores embedded in those spaces. If one places this point in conversation with Dana L. Haraway's (1991) refining of the nonhuman interacting with the human to produce behaviors impossible without the nonhuman, it becomes evident that the nonhuman's positionality cannot be ignored. Or, as Jamie Banks (2017) convincingly explains, "In order to understand the postmodern self in its multiplicities. . . away from the self (lowercased) that is rooted in a particular body and mind toward the Self (here, capitalized) that is a higher-order object of study, the human must be de-privileged" (p. 42).

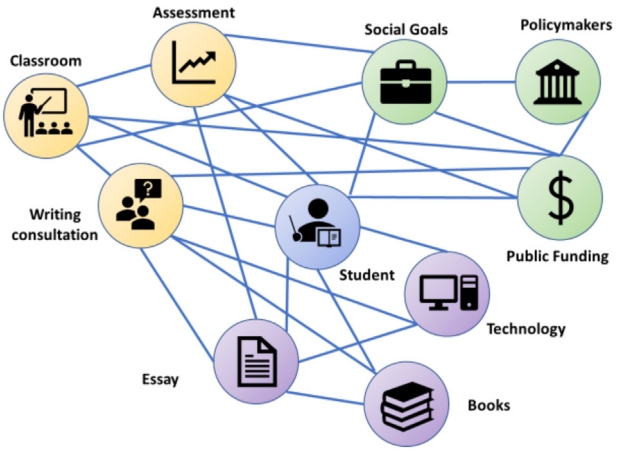

Fig. 2. Actor-network of a student seeking help with a class essay through a writing center consultation. Secondary colors represent different networks (i.e., green for government, orange for education, and purple for the student's private life). Note how ANT allows people, objects, and ideas all to be agent nodes within a network.

2.1.1. ANT in third skins

Much like the current CMC exhaustion experienced due to the exodus of physical activities to virtual platforms as a result of COVID-19, it was not uncommon to see early SOC literature show consultant and (to a lesser extent) student hesitation with technology associated with SOCs (e.g., LeCourt, 1998 and Carlson & Apperson-Williams, 2008). But this consideration is rarely a concern in contemporary SOC scholarship; quite the opposite, SOCs are now praised by students for their convenience. To address this dichotomy in the literature, we can turn to ANT and specific studies to see the technological actant in action. For example, Shana M. Mason and Kenneth L. Hacker (2003) demonstrate that technology use, from a communications aspect, is greatly influenced by the pervasiveness of a technology and time of existence. Additional research on attitudes toward objects that influence behavior (e.g., Ajzen & Fishbein, 2000; Petty & Briñol, 2015; and Payne & Dal Cin, 2015) demonstrate that specific attitudes in CMC change based on how users engage technology (Ledbetter, 2009). This is largely why younger generations adopt novel technologies with greater ease but why there is also variation in comfort and skill levels within any given generation.

Just as SOCs moved from novel sites with user discomfort to acceptance, likely issues stemming from the newness of virtual work will recede as more users interact. That is, teaching a class online for the first time can be intimidating. Additionally, users must navigate platforms that demand (*a la* ANT) participation in ways that may be nonintuitive. CMC exhaustion—or at least its magnitude—may in part be a synergistic case of cognitive overload where any one of these obstacles can be managed, but together they overwhelm. The good news is that underlying feelings can change. Feelings caused by the presence of a technological actant can be made positive through repetition when the relationship between the human and technological actant is acknowledged and cultivated—as illustrated with the history of SOCs. In other words, the more you engage the technological actant and familiarize yourself with it, the better you can perceive it and perhaps mitigate CMC exhaustion.

Note, this does not mean the network itself is any less difficult to engage. The challenges associated with online instruction, for example, do not disappear just because one is accustomed to the medium if the challenge is not related to perception. For example, finding a way to engage students in meaningful interactions with each other poses difficulty regardless of one's comfort with the technological medium. The medium itself (e.g., does it support a forum space, breakout rooms, etc.) dictates how any two people can interact amongst themselves through it. Thus, we must remember that introducing the virtual element to our work is akin to adding a third party to our efforts; SOCs are not sites for blanket education efforts for what one can achieve in them is dependent on what the medium allows. Additionally, the more a technology becomes engrained in everyday practice, the greater the capacity for it to influence networks of all kinds (McBride, 2003); this is why the technological genie cannot be put back in the lamp post COVID-19.

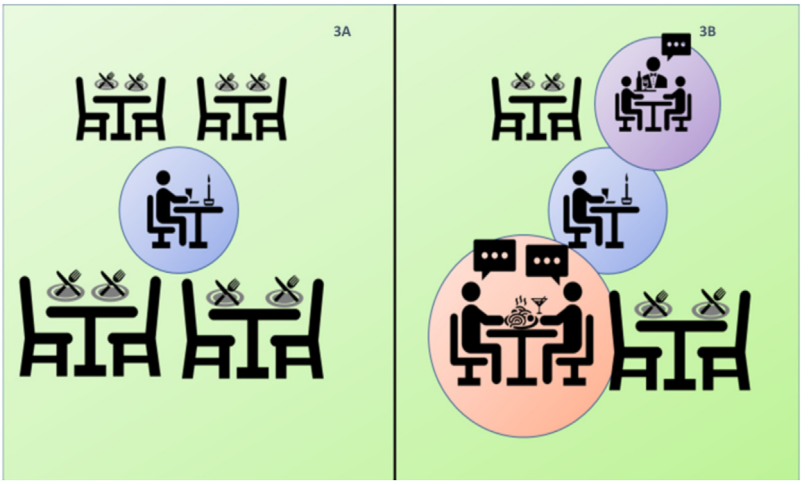

Fig. 3. Green represents surrounding space that is not occupied by any person. With the introduction of more people, the interstitial space carved out by the lone diner in Fig. 3A becomes new interstitial spaces produced in Fig. 3B. Not only do the different colors represent different interstitial spaces but also their slight overlaps with the center diner indicate how elements such as sound or smell can permeate into another's interstitial space.

2.2. *Element 2. Space encodes information but is also capable of being encoded*

A fundamental question in exploring CMC exhaustion addresses why we use CMC in the first place. As in, why do we use platforms that exhaust us if other avenues (that do not) exist? In constructing contemporary SOC spaces from once text-only to current AVT-integrated experiences, software developers have sought to ensure that experiences feel "real," and they have done so for logical reasons. From my own perspective, whether texting and wishing I had a way to convey tone or talking on the phone and wishing I could see a person's reactions, I could not help but voice to myself *it would be so much easier if this person could see and hear me*. AVT in CMC was designed for people like me who wished for these features. But physical cues for virtual needs holds implications beyond ease, which Muriel Harris (1998) cautioned on two decades ago as WCs further proceeded into the digital.

In integrating AVT features, developers assumed people's virtual experiences would match FtF ones. This cannot happen. While hearing a voice in CMC may produce an identical utterance from an FtF exchange, the spatial dynamics between speaker and listener do not carryover. And in understanding CMC exhaustion, this is key because space occupies fundamental but complex roles in all human interactions, physical or virtual. While space is commonly perceived via negative relation in that it is defined by a lack of what is there, space operates in multiple forms to enable selves and behaviors to exist/function. This is because, as Maurice Merleau-Ponty (1986) explained, "space is not the setting (real or logical) in which things are arranged, but the means by which the position of things becomes possible" (p. 243). For instance, spaces encode sites with narratives that proscribe behavior (Carpenter, 2008). But these narratives can be retrofitted by users to perform new functions that the space's architects did not intend (e.g., how a handrail can double as a balance for walking and for performing skateboarding tricks; Eco 1972).

One of the more interesting elements of space regards its invisible divisions in relation to human interactions. Consider how dining at a table for two with your partner feels different than eating side by side at the bar. But why? To understand the dynamics of space, first picture an empty restaurant. It can be defined as a singular bound space that people agree contained within its walls is the spatial experience of a restaurant. As soon as people enter that space, however, space becomes multifaceted. Specifically, the dynamics between interstitial space (i.e., the space shared between parties, which is filled with interaction cues) and surrounding space (i.e., the space beyond interstitial space, which belongs to neither party) fluctuate to create new, non-restaurant spaces according to participants' needs (Berry & Dieterle, 2016) (See Fig. 3 below). While all occurring within the same restaurant, from table to bar top divided spaces can range from intimate celebrations of anniversaries to strangers watching a sporting event on a television.

Spatial constructions of these personal kinds are both unconscious and instantaneous, which explains their susceptibility to influence. For instance, with the introduction of soundscapes by Raymond Murray Schafer (1977), sound has captured researchers' interests in constructing/disrupting space. This happens in the form of a phone ringing in

a movie theater rupturing the kairotic event of "being" in the cinematic space. Conversely, sound aids in interstitial space formation through verbal speech exchanges (e.g., speaking on a phone). What sound thereby demonstrates is how the nonhuman actant can influence spatial design—and in turn human behavior. In my Now, I am most cognizant of this when doing my work over Zoom and the dreaded *Your internet connection is unstable* notification appears. No matter how hard I have worked to build a cohabited virtual space, the terror of being dropped mid-sentence forces me to confront reality: the interstitial space I occupy is one-sided.

To many people, this may be a negligible blip, but for me, I recede. I deflate. I struggle. Mentally, it is draining. The hours invested prepping for an important presentation feel wasted when attendees cannot decipher a garbled word. Or counseling a student whose fear of the pandemic has generated such severe writer's block that she has lost four months of dissertation writing time—and the devastation felt when her internet cut out, and I could not be there to support her. I tell myself at the start of every workday to remember that while the people I interact with have a presence in my personal world, they are not actually present in my world. They are only as close as the technological spatial dynamics allow at that moment. Talk about fatigued.

2.2.1. Space as an agent in third skins

Despite space being tied directly to human experiences in CMC the way it is to FtF exchanges, general unawareness of it seems tied to its obviousness—a not uncommon theme also present in composition studies. In composition contexts, space is typically text/product oriented. Common examples invoke some figurative distance that writers must span to reach an audience (e.g., Black, 2007) or as a physical element that layers the nuances of composition practice (e.g., Reynolds, 2007). Though composition studies has broadened its view of what counts as space with digital technologies, the focus of these spaces remains similarly text-oriented. Virtual space considerations in composition studies largely derives from adopting Edward W. Soja's (1996) critical geography conception of thirdspace (c.f., Grego & Thompson, 2008). "A thirdspace is a commonplace where information senders and receivers can construct and transact ideas. . .. These thirdspaces, which connect the virtual and the real, are situated and contextualized for faculty and students in unique ways, and they require iterative examinations as these spaces or neighborhoods grow and change demographically and experientially" (Rice, 2015, pp. 394–397). In other words, thirdspaces are treated as sites where life exists within the virtual world.

The problem I have with this conception is that thirdspaces look at a space, not spatial dynamics, transfixed with virtual objects. For instance, Beth Hewett (2012) in a chapter called "Use Digital Space Wisely" conceives of space as a means to make communication stronger (e.g., crafting the space in a reply to a student so that feedback is clearer). Similarly, Diane Martinez and Leslie Olsen (2015) call attention to time and space, but they do so in a way that centers the text/medium as the spatial agent for which people need to understand the best ways to interact with said text. In both cases, space serves as an element to consider our work with texts rather than an element of our work. While it is important to understand how white space influences how we read a virtual text, such spatial considerations neglect accounting for the range of ways space exists as an agent. Specifically, the network overlooks how spatial interactions with technology affects users, CMC exhaustion included.

When divorced of text, composition studies literature has been more aware of space's direct influence on behavior—often how administrators design to encourage/discourage behaviors. For example, when Landon Berry and Brandy Dieterle explored group collaboration in technological spaces, they produced an elegant yet unexpected finding: shape of tables is important (2016). Not only shape but also the presence of rounded corners on said tables was a significant influence on how people engaged the space and in turn achieved their desired activity goals. Their research is part of a larger body of work that recognizes how space influences behaviors (Nowacek & del Sol, 2004 and Gierdowski, 2012) and outcomes (Inman, 2010). Moreover, WC administrators (in)famously design WCs to convey specific spatial narratives (e.g., Peter Carino's WCs as homes, 2003) through the welcoming presence of couches, coffee, and cookies. This is to say that administrators recognize that space greatly and quietly influences physical actions.

But what happens in a SOC where administrators cannot design the spatial context for the consultation? The issue in this design may reflect CMC exhaustion being the product of interacting in spaces that degrade user expectations. One of the ways that spatial considerations has been theorized in SOCs is the loss of administrative agency in designing the consultation space and in turn said use-narratives (Healy, 1995; Carpenter, 2008; and Nadler, 2019), a version of Candace Spigelman and Laurie Grobman's (2005) "on location" sites where conditions "cannot always be controlled" (p. 1). These arguments acknowledge how students' being able to log into consultations from a location of their choosing

Fig. 4. Fig. 4A represents a common WC space where spatial narratives encourage comfort and collaboration while minimizing distraction. Fig. 4B represents a lived space of a student that encourages narratives dealing with pleasure and privacy.

(e.g., a bedroom or a coffeeshop) influence the exchange compared to the predetermined sites that FtF consultations rely on (See Fig. 4 below). The spatial changes affect the quality of the session from an objectives' angle; unwanted elements including ambient noise and passersby degrade the intimacy of the session as explained by Steve Whittaker (2003). And in my Now, this is most humorously illustrated by the number of cats crashing AVT CMC of Parliament members. Simply put, when one experience (e.g., work) occurs in a spatial arena devoted to other experiences (e.g., home life), CMC users may find themselves waging "turf battles" and/or reacting to said battles, which in turn cause exhaustion.

But even if CMC is not battling physical disruptors in virtual spaces, it is constantly threatened by competing spaces. As a computer can simultaneously have tabs and windows open to an essay, Instagram, Netflix, Gmail, Wikipedia, etc., SOCs do not merely occur through devices capable of changing virtual spatial narratives; they can erect multiple spaces at once. Such is why the technological actant wields so much influence on human behavior within the ANT framework. And if these other worlds do not host the intended CMC interaction, danger arises: virtual platforms already blur the lines of interstitial and surrounding space, to add another layer separating a SOC participant from background, when both might feel like surrounding space, can push the other party out of the interstitial space entirely.

I would also venture that this element of simultaneous virtual worlds contributes to feelings that people express in my Now about time and space feeling askew—other possible CMC exhaustion traits. Whereas a physical classroom space previously encoded the environment as a specific context for me, my laptop has become the site of my current teaching. However, it is simultaneously my network for this article, cat memes, and a work-in-progress Y/A novel. So no matter how many times I use my laptop to teach, it cannot *feel* the same as a physical classroom not because the environments are different but because the spaces for possibilities are different. And if it does not feel the same, it may not be the same because spatial feelings influence user behavior—as noted by a colleague who refuses to attend another Zoom happy hour because his CMC exhaustion emerges from how media of his virtual work life encroach like the blob onto all aspects of his personal life.

2.3. Element 3. The physics of person-object interstitial spaces

As ubiquitous as CMC exhaustion might feel, it is a very isolating experience—in that it singles out an individual. Even if all parties within a CMC exchange are experiencing it, the exhaustion is not a shared experience. And this is important because this severed dynamic is different than how disrupters influence interstitial spaces in physical contexts. For instance, imagine two students in a FtF writing consultation jarred from their interstitial space by a fire alarm. The students, briefly disoriented, would then look at each other and figure out how to proceed, i.e., reestablishing their connection and their mutual interstitial space (MUIS). But in a SOC where a dog is incessantly barking in the background, parties may be pushed out of the space entirely—perhaps muting the offending party so that the speaker can function without aural barrage. In this moment, the parties are engaging the technology for recovery, not each

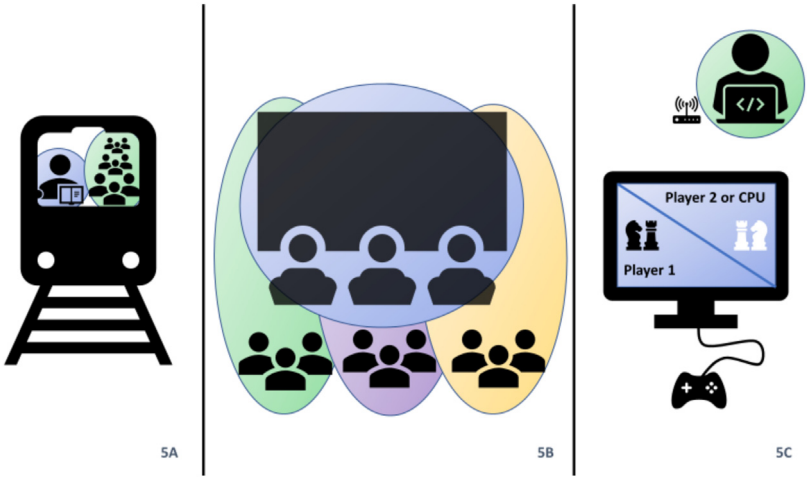

Fig. 5. Fig. 5A demonstrates how actions create personal interstitial spaces, regardless of setting. These spaces are not limited to single people or a medium as seen in Fig. 5B. Here, individuals at a film can share interstitial spaces with others, separate from other interstitial spaces, and all be connected to the same medium. However, Fig. 5C demonstrates that those not physically present do not share the interstitial space if they participate with the medium the way a CPU vs a live player does not affect spatial game interaction.

other. And while parties can relink, the FtF example never encountered such a separation—a divide where each person experiences the interruption disjointedly. Thus, what makes spatial dynamics of heightened importance within a SOC are then how virtual spatial considerations butt against physical spatial constructions. This is because physical spatial considerations (ultimately) override virtual ones as the unique properties of spatial interactions between human and object actants play a greater role in SOCs than FtF exchanges. But how and why?

If interstitial spaces arise from pocket worlds of larger surrounding spaces, what happens when one agent is not human? Reading best illustrates how technology's actant qualities mediate such spatial constructions. Consider how a book operates as a mode by which users of the technology leave one space and enter another (Schivelbusch, 1986 and de Souza e Silva & Frith, 2012). While technology-assisted disengagement has evolved from paperbacks to personal media centers on airplane seats, the rationale behind these disengagements has stayed the same: technology can be a spatial divider that results in telecocoons—sites where the user cleaves from physical spatial reality (Habuchi, 2005). More specifically, this telecocooning can lead to an "absent presence" (Gergen, 2002) that removes cognitive awareness of the surrounding world as a one-sided form of person-object spatial considerations. This is true regardless of if another person is being networked into that telecocoon. (Remember my talking to the student who was not there?). That is, when two people engage in CMC, rather than occupying a MUIS they engage CMC to enact two personal interstitial spaces (PEISs) that are linked.

I recognize that this idea may be uncomfortable to grasp because it relegates the person directly being communicated with to a representation—meanwhile, the technological actant occupies the space in the position we would traditionally ascribe to the other person. The utility in such thinking, however, emanates precisely from recasting the person interacted with from a mutual spatial exchange to a personal one. Such a perspective would account for why, speaking from personal experiences and echoed (to some extent[2]) by Lee-Ann Kastman Breuch and Sam J. Racinea (2000) and Barbara Monroe (1998), SOCs are fragile in that the physical technology broadcasting them feels more connected to the user than the student on screen. Moreover, the underpinnings of this concept are nuanced because absent presence via telecocoons can emerge in different setups. As such, I want to take the time to develop what I see as axioms to these interactions, and to do so I will use a triptych that scales person-object interstitial spaces.

As a guiding principle, recall that ANT treats *all* agents as equal. This does not mean that a book is more important than a person, but in terms of a network, a book can hold more prominence than a person. Ergo, the person in Fig. 5A

[2] I offset the works of other scholars here because the literature on these differences was published before the sea change of consultations offered with audiovisual technology. Text-based consultations, asynchronous or synchronous, are easily highlighted as different from FtF consultations, but little has been done to revisit this argument post-AVT.

creates a space when reading on a train that privileges the book as object in that space; the rest of the people on that train occupy a surrounding space that the reader is not cognizant of. This is an example of a simple PEIS because it involves only one person and one object. But let us consider what happens when multiple people engage the same object. As depicted in Fig. 5B, people can each form their own spatial relationship with the same object, which occurs when people watch a film together in a theater. Not only can the object be party to multiple spatial configurations, but also more than one person can exist in any of the spatial configurations. This explains how my partner and I can create a PEIS within a MUIS—how I may lay my head on his shoulder while being completely engrossed in the film—but excludes the people seated next to us, who have their own spatial relationships with the object (and possibly other people). The examples illustrate the one-sided nature of these spaces in that the object engaged does not have its own spatial conception of the relationship for the simple reason that a person cannot exist in more than one PEIS or MUIS at one time. Thus, the spatial interaction with an object is personal not in the sense that it is intimate (though it often is) but in that it is person-limited despite being configured with another agent. Note, these occurrences are not likely to produce CMC exhaustion because they represent scenarios (e.g., watching videos on YouTube) where synchronous interactions via CMC are not conducted.

But to explore a scenario that aligns with spatial dynamics of CMC exhaustion sites, imagine a person is playing virtual chess. In the case where the player goes up against a CPU, we would classify this interaction akin to reading a book. Yes, the game interacts with the player, but the amount of interaction is moot; consider that a movie "interacts" more than the static person watching it, but the spatial powers reside in the viewer's mind. Spatial constructions are about engagement: a passive book or active computer program are equal (*a la* ANT) in that they both create a network. But what happens when the player in Fig. 5C decides not to play against the CPU but another player joining via wireless technology from an unseen location? For the sake of simplicity, we will first assume that this game is AVT limited, so all Player 2 can do is generate moves. Excepting skill level, there is no playable difference between challenging the CPU or Player 2. Ergo, even though another person is involved in this act, Player 2 does not change the interstitial space—despite Player 2 simultaneously occupying an interstitial space with the same game. But should we say these are the same interstitial spaces? Perhaps one player is surrounded by friends for their weekly gaming night, where participants dress as their favorite board piece and cheer wildly for the person playing; the other player, simply enjoying the game from the solitude of his/her/their own room, quietly contemplates the next three moves. To suggest that these people belong to a MUIS merely because they are playing together ignores the power of ANT and physical space to create the network we find ourselves in any given moment.

But what if the game were outfitted with AVT? That there was a livestream at the top corner to project a player visually and audially. That both players are great friends who have for years participated in weekly chess matches. Are these two not sharing an interstitial space? To answer this question, let us first consider that instead of the AVT stream, the CPU possesses an avatar that interacts with the player similar to the interaction described above. That this is a machine learning program that recognizes the player and responds in quite human ways. Would we consider this a MUIS? No. As discussed in the previous examples, unless a piece of technology can consciously appreciate a space, the interaction remains a PEIS.

With that in mind, the streaming of a person does not matter as it is an element of the technological medium, not the actual person. I appreciate that some people might object to this premise, but the counterpoint's justification for considering synchronous AVT projections as capable of creating a MUIS concerns time, not space—which is why it does not suffice. If we removed the synchronic element—e.g., played a match via one-move-per-day format that recorded our opponent's move and watched after the move was recorded—we could not consider the interaction shared. The tendency to include AVT projections in a MUIS is because they recapture the synchronous element of FtF communication; however, time is only one element of a MUIS. When an AVT projection occurs, it shares neither physical nor virtual space—just the representation of it. The physical aspect is obvious (i.e., two people not in the same environment), but the virtual one is less so. While we might operate in virtual spaces—from shared google docs to massive multiplayer role-playing games—we do not exist within them anymore than we exist within a book or a film we are lost in. Though we might feel otherwise, that is the power of interstitial space. It is only the illusion of simulcast technology that makes us feel otherwise. And likely, it is this very approximation that mediates CMC exhaustion.

2.3.1. Linked PEIS in third skins

If people who engage CMC in a SOC are not creating a MUIS, then how should third skins classify these spatial interactions? As *linked* PEISs. A linked PEIS consists of any number of PEISs that synchronously engage another

PEIS for their spatial generation. Think of it as a line of Christmas lights that do not run on the same circuit; if one bulb goes out, the others still light up, but the overall lighting effect has changed.

And my years of SOC work attests to these findings, the dangers of a linked PEIS, and the possible onset of CMC exhaustion. Central to this premise is the phenomenon Linda Stone coined as continuous partial attention (later termed media multitasking; Rose, 2010 and Foehr, 2006), which addresses how virtual media require people to engage multiple small tasks to participate in a larger task. The beauty of working in FtF interactions is, cognitively, my mind does not have to make divide-and-conquer decisions. I can choose to look at a student or the student's writing without "losing" either; the physical presence of both near me creates a spatial relationship where I feel connected to the student in a shared space. In a SOC, however, a streaming projection of a student—the only tether I have if the student is not speaking—fights my ability to read a student's text: I cannot see a student and the writing simultaneously. Often, I must ignore the visual feed because, of the two, I need access to the text to do my work. Just saying that, however, is a bit crushing. And even when I do see the student, my mind is working overtime to interact because, as a species, we rely on more than only a shoulder-up view (in a tiny box) to read each other. The whole thing can sometimes feel artificial—especially when I know how different the scenario would be FtF. This is not to say SOCs are not beneficial! But the very nature of PEISs is where CMC exhaustion likely originates.

Bear in mind while the aforementioned examples, Reader, may not have been your experiences, they represent likely behaviors: reading on a train is akin to reading a student's paper, watching a film in a crowded theater matches for sitting in on a virtual lecture, and AVT-configured chess mirrors your Zoom meeting with another person. In all these examples, you are not creating shared spaces but carving your own spatial world through a technology that exhibits the presence of others into your world. And in doing so, you are intentionally creating an absent presence via telecocooning because you *need* to be engrossed in the world of the task. Typically, absent presence contexts require minimal mental efforts (e.g., walking and texting), and it is to our benefit to be snapped from these spatial worlds when we lose track of the larger physical world (e.g., bumping into a wall). But intentional CMC experiences are cognitively demanding, and because they are often essential (e.g., work), their disruption not only taxes us but also demands we invest extra energy to ensure we remain in these spaces when threatened with disruption. Why this matters is human interactions are premised on connections in ways we are largely unconscious to until we are challenged by their absence. Unfortunately, psychology tells us that humans are: 1) terrible at multitasking (e.g., Barshi, Loukopoulos, & Dismukes, 2012 and Wang & Tchernev, 2012), 2) socially evolved creatures (e.g., Tomasello, 2014 and Richerson & Boyd, 1998), and 3) really good at resisting things that deviate from routine or appear artificial (e.g., Wood and Rünger, 2016 and Mori, MacDorman, & Kageki, 2012) In other words, the strategies for creating, participating in, and maintaining PEIS are the very actions likely to exhaust us.

2.4. Element 4. Space as a proto-skin

Assembling the previous pieces of theory, we have ANT that allows us to see networks between people and objects. We then introduce a definition of space that allows us to recognize that people are influenced by spaces and can repurpose those spaces to their needs. This is why/how we carve out interstitial spaces to create personal worlds of meaning. But these interstitial spaces need not be constructed with other people as their focus; objects can center a PEIS. Though people not physically present can interact with us as we occupy these PEISs, they cannot share them—instead creating their own PEISs that are linked.

But why do these points matter? The answer is because they do not.

I do not mean to suggest that these considerations do not matter—they do and have important value in determining rhetorical contexts that influence behavior and CMC exhaustion specifically. Rather, I mean that all these considerations occur over the course of a SOC; however, we do not notice them to the extent that some have gone far enough on record to state that these interactions are not different enough from FtF exchanges to merit their own pedagogy. The rationale for such an oversight, I propose, is the third skins that emerge from these CMC encounters.

To appreciate how the third skin functions, though, one must understand how first and second skins manifest. First skins refer to literal skin but emphasize the totality of the body bound by said skin. This means skin as skin color but also skin as bodily appearance. If we look at a nude individual, a great deal of information is conveyed by the body as canvas: age, sex, race, ability, athleticism, health, and so forth. And those characteristics are but ones associated from a *human* perspective; our dogs view our first skins encoded with messages defining our species (hence why dogs do

not confuse people for other organisms), travel (determined by smell), and threat level. In this way, first skins function to convey immediate information about an organism that all sentient life relies on to determine interactions.

Second skins depart from the literal body and refer to clothing. Besides being functional (e.g., shielding our furless bodies from the elements), clothing encodes numerous messages. These include taste preferences (e.g., the trendiest shoes), economic clues (e.g., an expensive dress), sociopolitical themes (e.g., a hoodie), and so forth. Clothing is rarely *just* clothing (Ryan, 1966). Thus, the term second skin applies because clothing itself becomes a vital component for how we self-identify/others judge us as if it were an intrinsic layer of our being. Note, however, that second skin does not apply to clothes hanging in a closet but only the clothes on a wearer's body. Though any garment carries the same rhetorical messages whether worn on a body or hanging in a closet, skins are tied to a person: an Alexander McQueen dress on a hanger operates no different than a Picasso on a wall. The messages are associated with ownership in these cases, not embodiment. As such, while all objects can/do interact with an individual's identity, skins cannot be dissociated from the individual when inhabiting them.

Just as people view clothes as a self-extension, physical space almost functions as a third skin—though I am not aware of any literature that explicitly refers to space as a skin.[3] We could postulate, for example, that one's home operates as a skin. After all, does a mansion not convey immediate signifiers about its occupants the way a Rolex does? However, the difference between clothes and, say, one's home (both object and space) as skin deals with inhabitance (e.g., the clothes on a hanger are not a second skin). Additionally, any person can occupy the mansion in question—the residents or not. The information encoded then is aspecific to any occupier in that it is the ownership of the mansion that conveys signified information. Though objects of any kind can be tied, mentally, to a person, skins are visual products. As such, only information "worn" can be a skin, which explains why purely physical spaces are not normally skins.

2.4.1. Third skins

Rhetorically, the immediate audience in CMC is easy to identify: the party you interact with. But ANT challenges that assertion: the technological actant is your immediate audience. Remember, the interacted party in CMC functionally is not an audience but a tool (*a la* Stuart Blythe's trifecta terminology; 1996). While I have hypothesized many elements contributing to CMC exhaustion, I argue this switch in audience is the most critical in generating our exhaustion because it triggers a disconnect between how our minds desire to interact with our party and how are bodies engage CMC. The reason: space becomes a (third) skin in CMC.

Recall physical space in the physical world is open ended in how users carve it. What makes these spaces so malleable is the ability for any presence (person or otherwise) to enter the space and recast it, e.g., forming interstitial spaces or having a disruption force an interstitial space into the surrounding space. In all these instances, one person's space is invadable, which denies skin formulation. But in a virtual context, neither party can influence the other's space because there is no MUIS.; the illusion of AVT technology is that a viewing party is "there" with the projected party. Any disruption of these linked PEISs is not a disruption of the two parties but a person's engagement with technology.

This process of "flattening" the physical elements associated with the projected user into a virtual space derives the third skin (see Fig. 6 below). Through this transformation, space becomes strictly inhabited by whomever occupies it. It does not matter whether this space is theoretically private (e.g., a home office) or public (e.g., a coffeeshop). Whatever element exists in that space is condensed into a representation of the broadcaster at that moment in that Person X is Person X at the coffeeshop the way Person X is Person X wearing a green sweater. Any other person or object broadcast to the viewer becomes subsumed into the totality of this spatial third skin the way an image or a food stain on a T-shirt (i.e., intentional or not) enhances a second skin's totality.

In CMC, however, if all elements are flattened into third skins, then parties function no differently than whatever else appears on the viewer's screen. While the viewer knows a human is not a background, in terms of interaction—the hundreds of thousands of years our genes are encoded with to sociologically interact with others on top of billions of physical interactions we accrue in our lives—there is no human-defining element that separates the party from tool

[3] Media artist Randall Packer theorizes the third space as an overlay of first (physical) and second (remote) spaces. Technology is both the medium and product of these spaces. Conceptually, for me, spaces and skins differ due to the focus on place versus subject. Spaces define a person's positionality whereas skins define a person. The third skin and space are both interesting in that they each combine elements of people and space into a collected product, but there remains a vital positionality difference: third spaces can be open to others whereas third skins are tied to a specific embodiment.

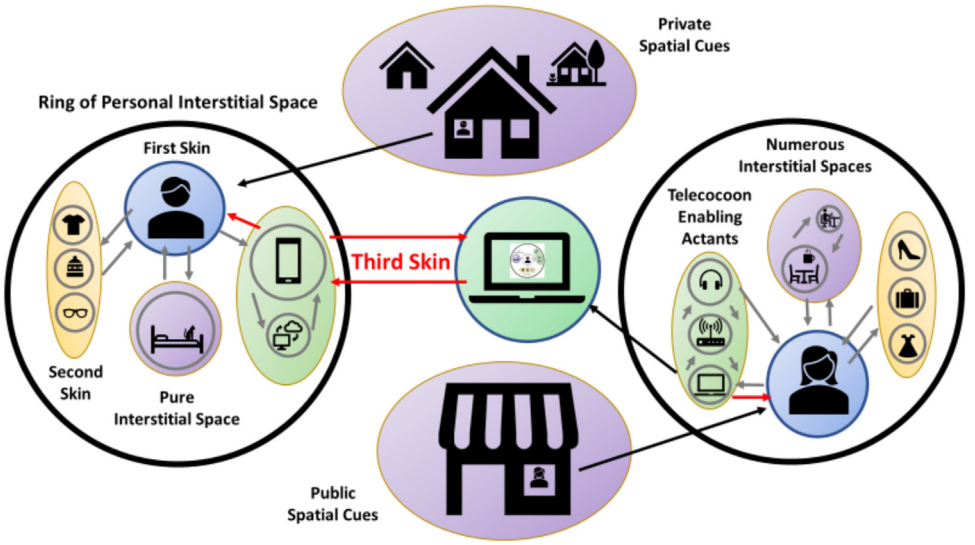

Fig. 6. This figure portrays the process of third skins by demonstrating the myriad spatial considerations and skins at play that become flattened by technological representation. This is why the complexities of any individual's experience cannot be carried through to the observer. Black arrows represent enlarged views of a relationship, gray arrows represent interactions that can be influenced, and red arrows represent interactions that cannot be influenced.

(Butler, 2006). Compare this to the way that the physical human in a FtF exchange demands an interactive spatial reciprocity that a tool does not. Such is why, ultimately, we work our cognitive abilities past their limits in trying to make human that which the third skin renders a projection.

3. Conclusions

Depending on what brought you to this piece, Reader, third skins might hold different importance. So I want to begin by addressing the broader relevance—to people who do not work with WCs or even composition studies. For these readers, third skins are about recognizing how the virtual worlds you navigate flatten your interactions due to spatial shifts between physical and virtual space. Cognitively, engaging this flattening work demands a great deal from us. And it most certainly challenges us to be on our best game because approximating the success of FtF exchanges necessitates more effort. I also admit I do not know if there is a darned thing you can do about this.

This is not to say these spaces are bad, so we should avoid them. This is not to say we cannot achieve great things through virtual platforms. I am reminded of when it starts to rain heavily while I am driving, and I need to silence the radio *to see* the road better. A friend driving with me once laughed at this: radio does not prevent you from seeing. *Au contrair mon ami!* When I need to focus on the road, radio is so much a cognitive distraction that my abilities to execute the task are dangerously compromised; turning it off lets me drive. And when the drive is smooth but I am sleepy, the radio is vital to keeping me awake because it stimulates my mind. But much of the time the radio is merely routine because I like to listen. The trick is to be cognizant of how the radio functions at any given time and then adjust accordingly. If virtual platforms are our car radios, third skins are the effects on our driving. CMC exhaustion manifests as the driving in heavy rain scenario, but we must remember that it is only one scenario.

And if you, Reader, come to this work from a composition studies perspective, I want to discuss the need and value of third skins from a praxis perspective. I find third skins not only help us understand how we feel because of our work but also may help explain observations in the field previously unaccounted for. The former point has been the focus of this work thus far.

In reference to this latter point, third skins may be contributing factors to research on SOCs. For instance, Joanna Wolfe and Jo Ann Griffin (2012) demonstrated that turn taking (i.e., how often a participant in a consultation speaks) is more skewed toward the consultant in virtual consultations than in FtF—in addition to lower-order concerns (e.g.,

spelling correction) occupying more time in virtual consultations.[4] This research compared FtF consultations with SOCs that incorporated only synchronous audio and a shared desktop (i.e., no synchronous visual stream). These findings complement the work of Erin Bradner and Gloria Mark (2001), which concluded that when visual elements are included in SOCs, these sessions are less effective than audio-only ones. If third skins flatten people visually, we must then realize that voice and appearance have very different effects on the human mind in a SOC than they do in FtF contexts—for while there is a human embedded in the third skin, the third skin is *of* human, not is human (Markham, 1998). Consciously or not, this can (in the case of Wolfe and Griffin) allow for a consultation to proceed where the consultant takes over because the consultant deprivileges the visual human element in the third skin by treating the third skin akin to a text in an AOC. Likely, voice escapes the totality of third skins in a manner that does not burden the mind—similar to how in FtF consultations I can read a student's text while listening to the student speak. Which is to say, in contrast to our human nature which privileges sight, third skins suggest SOC pedagogy should explore privileging the aural aspects of our work lest we inadvertently let FtF desires guide us to poorer performance and exhaustion.

Finally, in a broader sense, I want to acknowledge how for a long time—and heightened in COVID-19 where talk of the importance of STEM abounds—the humanities (and social sciences) have been asked to justify our work in terms of value. And as others have said before (c.f. Belfiore, 2015 and Olmos-Peñuela, Benneworth, & Castro-Martínez, 2015), this is a problematic construction because it assumes an idea of value that much of our work eschews (e.g., patents and products). The theory of third skins, however, stands up to those who dismiss our work as insular and unimportant. Maybe CMC exhaustion is not the result of the processes I have illustrated, but that is not the point. Currently in my Now, the world seeks knowledge about a mysterious condition caused by people entering certain spaces for the first time–spaces that our scholars have been researching and exploring for entire careers. While we have long recognized the value of our work to the larger world, I say it is long past time the larger world recognized the value of our work.

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References

Ajzen, Icek, & Fishbein, Martin. (2000). Attitudes and the attitude-behavior relation: Reasoned and automatic processes. *European Review of Social Psychology*, *11*(1), 1–33.

Banks, Jamie. (2017). Multimodal, multiplex, multispatial: A network model of the self. *New Media & Society*, *19*(3), 419–438.

Barshi, Immanuel, Loukopoulos, Loikia D., & Dismukes, R. Key. (2012). *The multitasking myth: Handling complexity in real-world operations*. Ashgate Publishing, Ltd.

Baudrillard, Jean. (1994). *Simulacra and simulation*. Ann Arbor: University of Michigan Press.

Belfiore, Eleonora. (2015). "Impact," "value" and "bad economics": Making sense of the problem of value in the arts and humanities. *Arts and Humanities in Higher Education*, *14*(1), 95–110.

Bell, Lisa Eastmond. (2011). Preserving the rhetorical nature of tutoring when going online. In Christina Murphy, & Steve Sherwood (Eds.), *The St. Martin's sourcebook for writing tutors* (pp. 326–333). New York: Bedford.

Berry, Landon, & Dieterle, Brandy. (2016). Group consultations: Developing dedicated, technological spaces for collaborative writing and learning. *Computers and Composition*, *41*, 18–31.

Black, Rebecca W. (2007). Fanfiction writing and the construction of space. *E-Learning and Digital Media*, *4*(4), 384–397.

Blythe, Stuart. (1996). Why OWLS?: Value, Risk, and Evolution. *Kairos: A Journal for Teachers of Writing in Webbed Environments*.

Bradner, Erin, & Mark, Gloria. (2001). Social presence with video and application sharing. *Proceedings of the 2001 International ACM SIGGROUP Conference on Supporting Group*, 154–161.

Breuch, Lee-Ann Kastman, & Racinea, Sam J. (2000). Developing sound tutor training for online writing centers: creating productive peer reviewers. *Computers and Composition*, *17*(3), 245–263.

Butler, Judith. (2006). *Precarious life: The powers of mourning and violence*. London; New York: Verso.

[4] This was attributed, in part, to grammar and spellcheckers enhancing the noticing of such errors.

Carino, Peter. (2003). Power and authority in peer tutoring. In M. A. Pemberton, & J. Kinkead (Eds.), *The center will hold: Critical perspectives on writing center scholarship* (pp. 96–113). Logan: Utah State UP.
Carlson, David A., & Apperson-Williams, Eileen. (2008). The anxieties of distance: Online tutors reflect. In Christina Murphy, & Steve Sherwood (Eds.), *The St. Martin's sourcebook for writing tutors* (pp. 285–294). New York: Bedford.
Carpenter, Rusty. (2008). Consultations without bodies: Technology, virtual space, and the writing center. *Praxis: A Writing Center Journal*, *6*(1).
Cover, Rob. (2012). Performing and undoing identity online: social networking, identity theories and the incompatibility of online profiles and friendship regimes. *Convergence: The International Journal of Research into New Media Technologies*, *18*(2), 177–193.
de Souza e Silva, Adriana, & Frith, Jordan. (2012). *Mobile interfaces in public spaces: Locational privacy, control, and urban sociability*. Routledge.
Eco, Umberto. (1972). Towards a Semiotic Inquiry into the Television Message. Translated by Splendore, Paola. In *Working Papers in Cultural Studies no. 6*. pp. 103–121.
Foehr, Ulla G. (2006). *Media multitasking among American youth: Prevalence, predictors and pairings*. Henry J. Kaiser Family Foundation.
Gergen, Kenneth J. (2002). 14 The challenge of absent presence. In *Perpetual contact: Mobile communication, private talk, public performance*. , 227.
Gierdowski, Dana. (2012). Studying learning spaces: A review of selected empirical studies. In Rusty Carpenter (Ed.), *Cases on higher education spaces: Innovation, collaboration, and technology* (pp. 14–39). IGI Global.
Grego, Rhonda C., & Thompson, Nancy S. (2008). *Teaching/writing in thirdspaces: The studio approach (Studies in writing & rhetoric)*. Carbondale: Southern Illinois University Press.
Habuchi, Ichiyo. (2005). Accelerating reflexivity. In Mizuko Ito, Daisuke Okabe, & Misa Matsuda (Eds.), *Personal, portable, pedestrian: Mobile phones in Japanese life* (pp. 165–182).
Hannay, Maureen, & Newvine, Tracy. (2006). Perceptions of distance learning: A comparison of online and traditional learning. *Journal of Online Learning and Teaching*, *2*(1), 1–11.
Haraway, Dana L. (1991). A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century. In *Simians, Cyborgs and Women: The Reinvention of Nature*. pp. 149–182. Routledge.
Harris, Muriel. (1998). Using computers to expand the role of writing centers. In Donna Reiss, Dickie Seife, & Art Young (Eds.), *Electronic Communication Across the Curriculum* (pp. 3–16). Urbana, IL: NCTE.
Healy, Dave. (1995). From place to space: Perceptual and administrative issues in the online writing center. *Computers and Composition*, *12*(2), 183–193.
Hewett, Beth L. (2012). *Instructor's study guide for the online writing conference: A guide for teachers and tutors*.
Inman, James A. (2010). Designing multiliteracy centers: A zoning approach. In D. avid M. Sheridan, & J. ames A. Inman (Eds.), *Multiliteracy centers: Writing center work, new media, and multimodal rhetoric* (pp. 19–32). Hampton: Press.
Jackson, Justin. (2000). Interfacing the faceless: Maximizing the advantages of online tutoring. *Writing Lab Newsletter*, *25*(2), 1–7.
Kimball, Sara. (1997). Cybertext/cyberspeech: Writing centers and online magic. *The Writing Center Journal*, *18*(1), 30–49.
Latour, Bruno. (2005). *Reassembling the social: An introduction to actor-network theory*. New York: Oxford University Press.
LeCourt, Donna. (1998). Critical pedagogy in the computer classroom: Politicizing the writing space. *Computers and Composition*, *15*, 275–295.
Ledbetter, Andrew M. (2009). Measuring online communication attitude: Instrument development and validation. *Communication Monographs*, *76*(4), 463–486.
Leigh, Ryan, & Zimmerelli, Lisa. (2015). *The Bedford guide for writing tutors*. Boston: Bedford/St. Martins.
Markham, Annette N. (1998). *Life online: Researching real experience in virtual space*. AltaMira.
Martinez, Diane, & Olsen, Leslie. (2015). Online writing labs. In Beth Hewett, & Kevin Eric Depaw (Eds.), *Foundational practices of online writing instruction* (pp. 183–210). WAC Clearinghouse.
Mason, Shana M., & Hacker, Kenneth L. (2003). Applying communication theory to digital divide research. *It & Society*, *1*(5), 40–55.
McBride, Neil. (2003). Actor-network theory and the adoption of mobile communications. *Geography*, *88*(4), 266–276.
Merleau-Ponty, Maurice. (1986). *Phenomenology of Perception. Translated by Smith, Colin*. Routledge and Kegan Paul.
Monroe, Barbara. (1998). The look and feel of the OWL conference. In Eric Hobson (Ed.), *Wiring the writing center* (pp. 3–24). Utah State University Press.
Mori, Masahiro, MacDorman, Karl F., & Kageki, Norri. (2012). The uncanny valley [from the field]. *IEEE Robotics & Automation Magazine*, *19*(2), 98–100.
Nadler, Robby. (2019). Sexual harassment, dirty underwear, and coffee bar hipsters: Welcome to the virtual writing center. *The Peer Review*, *3*(1).
Nowacek, Rebecca Schoenike, & del Sol, Kenna. (2004). Making space for collaboration: Physical context and role taking in two singing and songwriting groups. *Writing Groups Inside and Outside the Classroom*, 169–186.
Olmos-Peñuela, Julia, Benneworth, Paul, & Castro-Martínez, Elena. (2015). Are sciences essential and humanities elective? Disentangling competing claims for humanities' research public value. *Arts and Humanities in Higher Education*, *14*(1), 61–78.
Payne, B. Keith, & Dal Cin, Sonya. (2015). Implicit attitudes in media psychology. *Media Psychology*, *18*(3), 292–311.
Petty, Richard E., & Briñol, Pablo. (2015). Emotion and persuasion: Cognitive and meta-cognitive processes impact attitudes. *Cognition and Emotion*, *29*(1), 1–26.
Prince, Sarah, Willard, Rachel, Zamarripa, Ellen, & Sharkey-Smith, Matt. (2018). Peripheral (re)visions: moving online writing centers from margin to center. *WLN: A Journal of Writing Center Scholarship*, *42*(5–6), 10–17.
Rawlins, Paula. (2019). *UGA Writing Center End of Year Report, 2018–2019*. University of Georgia Writing Centers.
Reynolds, Nedra. (2007). *Geographies of writing: Inhabiting places and encountering difference*. SIU Press.
Rice, Rich. (2015). Faculty professionalization for OWI. In Beth Hewett, & Kevin Eric Depaw (Eds.), *Foundational practices of online writing instruction* (pp. 389–410). WAC Clearinghouse.

Richerson, Peter J., & Boyd, Robert. (1998). The evolution of human ultra-sociality. In Irenäus Eibl-Eibesfeldt, & Frank K. Salter (Eds.), *Indoctrinability, ideology, and warfare: Evolutionary perspectives* (pp. 71–95). Berghahn Books.

Rose, Ellen. (2010). Continuous partial attention: Reconsidering the role of online learning in the age of interruption. *Educational Technology*, *50*(4), 41–46.

Ryan, Mary Shaw. (1966). *Clothing: A study in human behaviour*. pp. 14–23. New York: Holt, Rhinehart and Winston Inc.

Schafer, Raymond Murray. (1977). *The tuning of the world*. New York: Knopf.

Schivelbusch, Wolfgang. (1986). *The railway journey: The industrialization and perception of time and space*. Univ of California Press.

Soja, Edward W. (1996). *Thirdspace: Journeys to Los Angeles and other real-and-imagined places*. Blackwell Publishers.

Spigelman, Candace, & Grobman, Laurie. (2005). *On location: Theory and practice in classroom-based writing tutoring*. Logan, Utah: Utah State University Press.

Tomasello, Michael. (2014). The ultra-social animal. *European Journal of Social Psychology*, *44*(3), 187–194.

Wang, Zheng, & Tchernev, John M. (2012). The "myth" of media multitasking: Reciprocal dynamics of media multitasking, personal needs, and gratifications. *Journal of Communication*, *62*(3), 493–513.

Whittaker, Steve. (2003). Things to talk about when talking about things. *Human-Computer Interaction*, *18*(1), 149–170.

Wiederhold, Brenda K. (2020). Connecting Through Technology During the Coronavirus Disease 2019 Pandemic: Avoiding "Zoom Fatigue.". *Cyberpsychology, Behavior, and Social Networking*, *23*(7), 437–438.

Wolfe, Joanna, & Griffin, Jo Ann. (2012). Comparing technologies for online writing conferences: Effects of medium on conversation. *The Writing Center Journal*, *32*(2), 60–92.

Wood, Wendy, & Rünger, Dennis. (2016). Psychology of habit. *Annual Review of Psychology*, *67*, 289–314.