Lickable Cities: Lick Everything in Sight and on Site.

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Abstract
Lickable Cities is a research project that responds to the recent and overwhelming abundance of non-calls for gustatory exploration of urban spaces. In this paper, we share experiences from nearly three years of nonrepresentational, absurdist, and impractical research. During that time, we licked hundreds of surfaces, infrastructures, and interfaces in cities around the world. We encountered many challenges from *thinking with, designing for*, and *interfacing through* taste, including: - *how can and should we grapple with contamination?,* and - *how might lickable interfaces influence more-than-humans?* We discuss these challenges to compassionately question the existing framework for designing with taste in HCI.

Author Keywords
Lickable cities; lickable interfaces; tasteful design; tasteless design; urban informatics; more-than-human design; nonrepresentational theory; NRT

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H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous

Introduction
We hold these truths to be self-evident, that all: humans and more-than-humans are created equal; "your base are belong to us" [10], and; surfaces, infrastructures, and interfaces are lickable. This paper focuses on the latter self-evident truth, which has been largely absent from HCI research. In fact, licking in general—

and especially as a method for *thinking with*, *designing for*, and *interfacing through* taste—has been largely absent from HCI research.

A relatively limited but growing body of research in HCI addresses designing with and for taste [24]. Much of this research relies on controlled laboratory studies or novel taste-related experiments (e.g. [21,20,25,28]). These studies—while contributing interesting and valuable insights to the HCI community—implicitly ignore the self-evident truth that all infrastructures and interfaces are lickable and possess unique gustatory[1] dimensions. Moreover, these controlled experiments and provocations do not engage with the complex, situated, multisensory, and highly personal nature of our dynamic urban settings.

We have spent much of the past three years licking public and private interfaces, infrastructures, surfaces, flora, and fauna, including but not limited to: art, propaganda, vehicles, flowers, rocks, a demon goat puppet, lamp posts, outdoor chairs, public transit benches, mailboxes, history, walls, and waterfalls. We conducted most of our gustatory research in cities, parks, and peri-urban spaces around Europe and North America. But we also explored and examined the gustatory effects of air quality issues in China (e.g. [12,13]), used design fiction to propose new urban interventions (e.g. [11]), and followed more-than-human gustatory stories from around the world (e.g. [4,7]).

In this paper, we describe our research project, *Lickable Cities*, whilst offering photos and quotes from one of our researchers' "autogustographic" journal entries[2]. We outline a few challenges that we encountered while thinking with, designing for, and interfacing through taste in public, urban settings. We reflect on these challenges as part of our attempt to compassionately question the framework outlined by Obrist et al. [24] for designing with taste in HCI. We hope to offer our reflections, as well as the Lickable Cities project more broadly, as novel contributions to the HCI community. At the very least, we hope to entertain, disgust, and/or inspire readers with our absurdist research endeavour.

[1] For those unfamiliar with the term "gustatory", it comes from the latin word gustus and refers to our sense of taste.

[2] Autogustography is the nonrepresentational approach that we have developed for self-tracking and self-reporting our gustatory endeavours. It is inspired by autoethnography.

Related Work

We have yet to encounter research that uses licking as its primary method for gathering data. However, a limited but growing body of research in HCI considers taste [24].

HCI and Taste

Taste is one of our most complex senses. It is resistant to quantification, profoundly situated, individual, ephemeral, and difficult to replicate [2, 32]. Perhaps for these reasons, *thinking with*, *designing for*, and *interfacing through taste* are inherently challenging endeavours for all researchers, including those within HCI. Although a growing number of HCI publications address food and food cultures, a relatively small number of publications directly deal with taste [24]; those that do appear to fall into two overlapping branches of research.

The first branch encompasses electronic artefacts that empirically experiment with taste. The work by Narumi et al. [21], Murer et al. [20] and Ranashinghe and Do [25] exemplify the first branch of research. The lickable device 'Lollio' [20] is a physical artefact which uses licking as its tactile and gustatory interface. Murer et al. [20] explore enjoyable and undesirable tastes, as well as device orientation for interface modality. Narumi et al. [21] in contrast explore the potential of gustatory holograms to simulate foods. Through a complex apparatus the user is exposed to mixtures of scented air samples which provoke an experience of "pseudo-gustation" [21]. The authors describe this as an *olfactory AR technology* [21]. Ranashinge and

Figure 1: Chief Eggnographer, Vanessa Thomas, licking history (i.e. the foot of John Dalton's statue [1855], in central Manchester, England). 2017. *Photo credit: Chief Gustographer Manu J. Brueggemann.*

Figure 2: Chief Catnographer, Ding Wang, wearing her face mask during a high-pollution day in Beijing, China. 2016. Dispatch available on Twitter [12]. *Photo credit: Ding Wang.*

Do [25] use lingual electrostimulation through computer controlled electrodes to provoke gustatory experiences. Their key interest is the notion of remote communication of taste experience and information.

The second branch draws heavily on literature and methods borrowed from psychology and sensory science, seeking to gain insight into the physiology of taste perception and cognitive sense-making of gustatory experiences in relation to HCI. Obrist et al. [24], and the design qualities of individual taste experiences they describe, epitomise this strand of research. In their paper, Obrist et al. draw on research about the five basic tastes (i.e. sweet, sour, salty, bitter and umami) to inform a laboratory study linking taste with shapes. This allowed the researchers to highlight how temporality, affective reactions, and embodiment might be of value to HCI researchers and interaction designers looking to create taste experiences.

Whilst these overlapping bodies of research have offered HCI a variety of novel insights and designs, we believe that they implicitly ignore the self-evident truth that all surfaces, infrastructures, and interfaces are lickable, and possess unique gustatory dimensions. The existing research does little to prepare HCI researchers for deploying lickable interfaces and technologies in urban settings.

Lickable Cities

Urban environments expose designs to weather systems, local microbiomes, more-than-human interaction, as well as temporally dynamic socio-political and economic factors. Our research project, *Lickable Cities*, takes steps towards designing gustatory interfaces for urban environments; it is a provocation for and by HCI researchers interested in thinking with, designing for, and interfacing through taste.

A brief history of the project

Lickable Cities has been running unofficially since 1994, when Chief Eggnographer Vanessa Thomas started licking things in the streets of Edmonton, Alberta—her northern Canadian hometown. In 2014, *Lickable Cities* became an official research endeavour. Chief Gustographer Manu J. Brueggemann dared Vanessa to lick a red carpet that had been placed for an imminent royal visit to Lancaster University. After licking the carpet, Vanessa and Manu began discussing the politics of licking practices, as well as the subversive and productive potentials of 'licking': gauging what is and isn't deemed appropriate to lick. Chief Catnographer Ding Wang joined the conversation and, from that dialogue, we brewed this sweet, savoury, and salty project.

Shortly thereafter, we immersed ourselves in diverse literature that described taste (e.g. [2, 3, 5, 19, 32]), sensory and multisensory exploration of cities ([6]), and non-representational theory (e.g. [15, 31]). We learned that our sense of taste could be influenced by our other interconnected senses (i.e. auditory, tactile, visual, olfactory, nociception[3], etc.), as well as our social settings and economically derived expectations [1, 5, 19, 22, 23, 26].

What stood out most for us were the notions that taste would resist quantification, defy easy replication, and be profoundly situated, individual, and ephemeral [2, 32]. We had hoped that we could find existing guidance on how to explore cities by tasting them—and more specifically, by licking them—but we found no such guidance. Instead, we crafted our own approach to licking cities.

Our nonrepresentational, impractical, absurdist, and nonmethodological approach to licking cities

By *nonrepresentational* (NR) research, we mean that some of our work is rooted in NR-theory, which seeks to better "cope with our self-evidently more-than-human, more-than-textual, multisensual worlds" [15]. NR-theorists often critique experimental and conventionally empirical research—like many studies within

[3] The bodily sense of anticipating imminent pain.

Figure 3: Vanessa leans down to lick the wet, walked-on floor of an Olafur Eliasson installation in ARoS, Aarhus, Denmark. 2017. Partial dispatch available on Twitter. *Photo credit: Zoe Luski.*

Figure 4: The lid of a trash bin that Vanessa licked—strategically choosing to lick a part of the lid that would have been touched frequently. Edmonton, Canada. 2017. Complete dispatch available on our blog [14]. *Photo credit: Vanessa Thomas.*

HCI—as being unhelpfully reductive [31]. NR-theory brings (back) into consciousness the pervasive, yet invisible; the mundane that is continuously overseen, the universal yet unaccounted layer; that which is always new and yet in its ephemerality never deemed original. It is a theory that understands itself consciously breaking with established relativist and positivist oppositions in order to address their shortcomings and to outline some advances to their resolution. We adopted a nonrepresentational approach for much of our research because taste is situated, personal, cultural, more-than-textual, more-than-human, and multisensory [2, 10, 19, 32]. Cities are a wealth of things to different humans. Their gustatory dimension however is (for the average citizen) of *peripheral interest* at best.

This however may not be the case for actors with non-human senses whose perceptions may emphasise taste-scapes. Seeking to sensitise ourselves to these more-than-human worlds and other-than-representational dimensions of the city, NR-theory appears to be a fitting framework in which to conduct more-than-human and other-than-human investigations.

By *absurdist* research, we mean to acknowledge that many of our research endeavours could be considered "absurd". After all, wandering around cities and licking a variety of urban infrastructures and interfaces is not an everyday activity for most people. For us, it was an intentionally ridiculous, bizarre, and at times utterly senseless pursuit.

Similarly, much of our research was *impractical*, both in terms of what we set out to do and how we conducted our research. For example, the location of many urban interfaces and infrastructures made them impractical to access. We were unable to lick any interfaces mounted on the sides of skyscrapers—although we would have loved to do so, if the opportunity had arisen. Moreover, it was impractical for us to get ethical approval for any Lickable Cities studies involving other people. We could not guarantee their health and safety; we could only consent to risking our own.

The *nonmethodological* dimension of our work refers to our radical faithfulness to the cityscape and the circumstances in which it serendipitously presented our datapoints. We chose this faithfulness rather than a systematic or pre-determined sampling structure. What emerged as being lickable only became apparent as we engaged with our surroundings. It sprung out of a subjective-yet-perceptible conglomerate of weather, neighbourhood ambience, our moods and agendas, as well as the human and more-than-human actants we interacted with, each of whom fed back into our moods. Such phenomenological approaches enabled us to remain faithful to our goal that conventions ought not to be dictating our method but context and situation.

Dispatches from the field

To highlight some of the difficulties we encountered while undertaking our research, this section includes three dispatches from our fieldwork[4]. They are meant to demonstrate how we worked to notice and record information every time we licked something. We did this whilst simultaneously uncovering and developing our NR, impractical, absurdist, and nonmethodological approach to licking cities.

Due to the emergent nature of our approach, our dispatches vary in scope and detail. For example, at first—even though we had read literature discussing how economic expectations influence our sense of taste—we did not think about how neighbourhood demographics and urban investment might influence our gustatory experiences. In fact, we were not always aware of the demographics in neighbourhoods where we licked interfaces, infrastructures, and surfaces. When we realised that we had predominantly been in middle class neigh-

[4] More dispatches can be found on our blog [14].

Figure 5: The table described in 31 July's dispatch. Edmonton, Canada. Complete dispatch with additional gustatory experiences available on our blog [14]. *Photo credit: Vanessa Thomas.*

Figure 6: The tree described in 17 July's dispatch. Edmonton, Canada. *Photo credit: Vanessa Thomas.*

bourhoods, we intentionally visited industrial parks and socioeconomically diverse communities. But there was no way for us to methodologically or methodically control for weather, our moods, the humans and more-than-humans we interacted with (and who then influenced our moods), the natural or unnatural sounds in the communities we frequented, or the foods that we had eaten earlier in the day—all of which would influence the taste of what we licked.

The following three dispatches—prefaced in bold by the date of the gustatory experience—highlight these dimensions of our approach:

31 July 2017: *"I was working underneath a big tree on the University of Alberta's campus, and I had been staring at the Power Plant. I'd been sitting under this tree for a few hours, diligently working on several things, when a squirrel started freaking out beside me. It started chewing on something with that adorable double-fisted chewing motion that so few humans do, and that inexplicably inspired me to lick the table where I was working. Like, "yea, okay, squirrel. You're doing your thing, I'll do mine."*

The tabletop was slightly sweet, slightly salty, slightly gritty, and very warm (from having sunlight shining on it directly, I assume? I don't think I licked a spot where I had been leaning?). It was a little bit rough; the tabletop was somewhat textured. The aftertaste was VERY unpleasantly tart. In one ear, I could hear the squirrel still occasionally freaking out (it was, like, jumping and squeaking and then eating things), and in the other ear I was listening to Final Fantasy's `This Lamb Sells Condos'."

17 July 2017: *"Nothing too exciting today! I was out for a wee walk and decided to lick a birch tree! I'm (apparently) severely allergic to birch trees, which was part of the appeal. "What will happen if I lick this? Will it taste really bitter? Will my tongue swell up?" I was so excited as I walked up to the tree.*

I licked it. It was delicious! Not like, "this will be an everyday kind of thing" delicious, but tasty! Kind of sweet. Kind of dewey? It tasted familiar somehow. The aftertaste was also kind of nice in, like, a... freshly cut grass kind of way. The texture was a bit rough, but that's kind of to be expected of a tree, no?

Musical accompaniment: Daedelus' Aries. *Weather: pleasant! A bit cloudy, but warm. Nearby scents: none that I noticed. I would lick another birch tree. Maybe an older one. This one was still pretty young..."*

1 July 2017: *"Inspired by a Skype conversation with Manu this morning, I set off on a lengthy bicycle adventure with the goal of licking something new and unusual in Calgary. Then I promptly (and predictably) forgot about this goal. I cycled gleefully through Calgary's northwestern suburbs and then through some of its forested grasslands without stopping to lick a thing. I cycled for over an hour and a half before I remembered that I had planned to lick something. Watching black smoke heave out of the back of a Caterpillar seemed to jog my memory. "Oh google, it's like you KNEW I wanted to lick something in a non-middle class urban environment!"*

I slowed down and started to contemplate my surroundings. What would be ideal to lick? Pavement? A building? Someone's parked car? A fence? Bored! The buzz of overhead electrical lines captured my attention.

It was hot outside. Really, really hot. And sunny. I had not stopped often enough to drink liquids during my bicycle ride (I was sweaty and definitely gross). By the time I walked up to the electrical tower I had decided to lick, I was pretty dehydrated. My saliva had that... sort of level of stickiness that it gets when you're thirsty. I don't think I've licked anything for the Licka-

Figure 7: The electrical tower described in 1 July's dispatch. Complete dispatch with additional gustatory experiences available on our blog [14]. Calgary, Canada. *Photo credit: Vanessa Thomas.*

Figure 8: Vanessa leaning down to lick the base of a waterfall in Yosemite National Park, USA. 2017. Complete dispatch available on our blog [14]. *Photo credit: Oliver Bates.*

ble Cities project while being THAT dehydrated. Sure, I briefly contemplated drinking a bunch of the water I had in my bag, but I ultimately decided to give licking a go while being dehydrated.

I walked up to the electrical tower, licked my thumb, and touched a side that I did not plan to lick (just to see if I'd get a small shock). I didn't feel a shock, so decided it was safe. I leaned my bike against one of the tower legs, and then full-tongue licked it.

It didn't taste like anything. It was warm. Its texture was smooth. My saliva was visibly thick on the tower. I licked it again with just the tip of my tongue to see if that made a difference. It didn't. The tower was just... flavourless. Not salty. Not gritty. Not anything.

[When I got home later], I realised that I had brushed my teeth immediately before leaving the house in the morning. Did this affect my sense of taste while licking the electrical tower? Was the dehydration more of a factor? Why wasn't it salty, but so much of the other infrastructure [I had licked thus far had] been? I always seem to come away from these licking adventures with more questions than answers..."

Reflections from licking cities

Licking as research is many things: the practise is subversive, and we intend it as such. Engaging in gustatory explorations in such an original way presented us with a number of challenges, which we reflect on here.

How can and should we grapple with contamination?
Contamination became a challenge for us because one of our researchers fell very ill in early 2017, most likely because of LC engagements. A cityscape's microbiome is complex, and we were directly confronted with our incapacity to control who/what licks a public urban interface. Other forms of contamination also confronted us. From the diary entries it becomes clear that our expectation 'contaminated' our reactions, either affirming or baffling us. Ephemeral encounters with other humans 'contaminated' our mood and thus experience. An overall theme of saltiness emerged in our urban lickscape. We may attribute this to an abundance of inorganic minerality within cityscapes—but saltiness is also something organic bodies are very familiar with: blood, sweat, urine, tears and vomit are all salty, as are winter-salted roads, the ocean or corroded art.

Moreover, licking as a research practise contaminates the clean allure that empirical research, user studies, and ethnographies seek to maintain. The act of 'licking' in an academic setting transgresses boundaries. Baffllement accompanied us throughout the project, from first instances of data collection to beyond paper submission. We emphasise with such strong reactions to something mundane as licking as a protective acts that seek to protect existing traditions in HCI, but we seek to challenge these. Taste occurs at the boundary between the individual and political and forces us to *do messy science*, which is the value of taking taste seriously.

How might lickable interfaces influence more-than-humans?
More-than-humans have already been significantly influenced by our digital technologies. For example, sharks have attacked deep sea internet cables [9], squirrels have chewed through cables at data centres [18], and countless ecosystems have been contaminated throughout the life-cycle of electronics [30]. Furthermore, many animals have been known to lick human-centred designs—at times to the detriment of their health (e.g. [4, 7]). As such, any deployments of lickable interfaces, surfaces, or infrastructures in non-laboratory environments demands some consideration of their effects on more-than-humans.

Lickable interfaces deployed in urban spaces might: expose more-than-humans and humans alike to new diseases; attract animals to urban locations where they

Figure 9: The treads on the caterpillar track of a parked construction vehicle. Edmonton, Canada. 2017. Complete dispatch available on our blog [14]. *Photo credit: Vanessa Thomas.*

Figure 10: A traffic cone in an industrial park. Calgary, Canada. 2017. Complete dispatch available on our blog [14]. *Photo credit: Vanessa Thomas.*

are unsafe or unwanted (e.g. [7]), or; cause unexpected and potentially dangerous interactions between more-than-humans and humans (e.g. insects swarming a lickable interface and getting 'stuck' on it, making the interface less desirable to use). We believe that the emerging community of researchers who claim to be concerned with more-than-human interaction and animal-centred design (e.g. [16, 27, 29]) might be able to identify additional more-than-human challenges.

Expanding our notions of designing with taste in HCI

Martens [17] inquires "What characterizes sensory science and makes it unique? What may constitute a foundation for sensory science? Why isn't the discipline a part of either chemistry or psychology?" We hope to have showcased that gustatory explorations confront us with the limits of what traditional frameworks in HCI can offer us. Taste has an individual and emotional depth to it, and by stubbornly 'considering everything lickable' we challenge HCI to acknowledge that 'everything' possesses affordances that resist quantification and rational inquiry. "Cities" as tastescapes are intentionally abstract subjects for such a study; not least because of the significant role concrete possesses in its construction and composition.

A single person's ability to taste the world is limited, and we—a small group of researchers—became confronted with the limitations of what we were able to achieve when trying. Even the most zealous tongues and mouths are finite in their ability to sample the world; and that was clear right from the outset. It was in recognition of our limitations that we committed to situated topologies. We believe our approach, as well as the contamination and more-than-human challenges we identified, could help expand the framework offered by Obrist et al. [24].

We also choose to leave the HCI community with a few of our lingering questions: who will decide what is "average" in terms of likeability for lickability or taste-related designs? How will we include or exclude super-tasters and non-tasters? How will we cope with certain flavours that do or do not travel across cultures, ages, or social classes? What might we lose by ignoring these dimensions of taste in our designs?

Future Work

Due to the highly novel, subversive, and absurd nature of *Lickable Cities*, it could and should inspire a variety of future projects within the HCI community. Our team has recently started to develop a prototype of one such future project: LickAdvisor (see: Fig. 11).

LickAdvisor is partially inspired by TripAdvisor; it will be a web-based service that allows humans and more-than-humans to share their geotagged stories about licking cities. Unlike TripAdvisor, which claims to offer "unbiased reviews", LickAdvisor will *only* feature biased reviews. It will allow everyone to embrace our nonrepresentational, impractical, absurdist, and nonmethodological approach for licking urban surfaces, infrastructures, places, spaces, and interfaces. Patrons of the service will be able to film themselves—but only in landscape mode; never portrait—or post photos of themselves, licking their desired target. They will be able to leave a text-based review of their gustatory experience, too, ideally including some information about their multisensory experience (e.g. nearby sounds). Through LickAdvisor, we will collect and possibly analyse—or ignore! or perhaps we will simply look upon it with admiration!—a large corpus of the diverse lickscapes and tastescapes offered by our global cities.

Conclusion

In this paper, we described LC, our nonrepresentational, nonmethodological, absurdist, and impractical gustatory research project. We shared some of our experiences from nearly three years of using licking as a subversive research practise. By describing our novel and absurd research project, we have mapped out new questions and approaches for the HCI community, es-

Figure 11: LickAdvisor is an in-development app. *Logo design credit: Philip Robinson.*

pecially for those members in the community interested in *thinking with*, *designing for*, and *interfacing through taste*. Most importantly, though, we hope that our paper and project might have encouraged people of all stripes to undertake gustatory investigations of cities and beyond. After all, it's a glorious time to be licking surface, interfaces, and infrastructures! So please, get out there and start licking your city! Then report back to us! FOR SCIENCE.

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Commentary

For alt.chi paper
Lickable Cities: Lick Everything in Sight and on Site

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I enjoyed reading this paper and it made me start licking objects and surfaces on my desk, exploring their taste, much to the bewilderment of my colleagues. Taste is an often-neglected sense in the digital world, probably because – as the authors rightfully argue – due to its resistance to quantification and complexity. We live in a world that is dominated by visual and auditory senses. While smartphones have started to incorporate tactile experiences, this is only in its infancy. Taste – and smell! – are, however, still largely left out. The authors therefore draw attention to this under-explored field. Speaking of smell – I wish the authors had discussed how smell and taste interact. In fact, much of what we consider taste (everything beyond the five basic tastes) is actually smelled.

I appreciate the open discussion of the messiness of their research, something that HCI and many other research fields do not acknowledge, presenting their research activities in a very stringent and structured narrative. In this light, I disagree with their notion that licking experiences are 'contaminated' by expectations, moods, and previous tastes. I find this view overly negative and a bit contradictory to the rest of the paper. Don't these contextual experiences simply *make* the taste? When they talk about reviews on LickAdvisor, they rightfully talk of them as intentionally biased, as the taste experience in my eyes is inseparable from the rest of human experiences. It is then for HCI to acknowledge this complexity and richness in designing its common poor interfaces that limit interaction to the visual, auditory, and (maybe) tactile senses.

I took particular interest in the discussion of contamination of humans through licking surfaces that might contain substances that cause diseases. There is a real lesson to be learned here for HCI, considering all the visual and auditory contamination we are exposed to everyday (e.g. by bad design or advertising). Moreover, safe interactions with objects are generally regulated in international standards (e.g. potential physical harm through manual interaction, strains on eyes, or loud noises). Taste and smell are, however, again senses that are largely ignored. I would have loved to see a more in-depth discussion on how to design lickable interfaces considering the danger of contamination.

I also applaud the authors for including more-than-humans in their discussion, something that an inherently human-centric HCI continues to fail to address in much of its research body. Considering the ongoing shift in HCI to move from the lab 'into the wild', we need to include more than just humans in our research and design. Again, there is a lesson to be learned for designing visual interfaces: The authors discuss how taste-interfaces might attract insects. Similarly, hardly anyone discusses how e.g. public displays or other screens at night might attract insects or other animals, thus disturbing their natural habitat.

I am looking forward to see the presentation at CHI and would love to join the team on a walk around Montreal to lick the cityscape. However, given the limited time and that we will mostly be trapped in a big building, I would suggest the authors to bring in a selection of interesting objects to lick. The objects could also be a good case study to think about contamination and the design of lickable interfaces.