The Locative Imaginary:
Classification, Context, and Relevance in Location Analytics

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Introduction

'The most important thing, if you want to know how the customer feels, is to know where they are… The first piece to start with is to know where they are.'[1]

The analysis and prediction of location to understand consumer dispositions and intent, however reliable or desirable it may be, is a key attribute of data-driven marketing. Location data brokers and analytics platforms now routinely collect, clean, and commodify everyday locations and movement patterns from smartphone sensors and media. The infrastructures of consumer targeting, segmentation, and measurement, and in turn the ways marketers internalize particular values of relevance and success, are increasingly governed by location-based industry practices (Miles, 2019). Data licensing agreements with 'third parties' expand the range of available markets for targeted adverts, allowing publishers to charge higher prices for location-based advertising inventory and increasingly specific geodemographic segments. Advertisers have already shifted their budgets towards a preference for mobile audiences (PwC, 2018). Industry projections anticipate growth for

location analytics, nearly doubling from $8.3B in 2016 to $16.34B by 2021 for retail, digital marketing and media, healthcare, transportation, logistics, and defence markets[2].

These investments reflect a deeper theoretical interest in subjectification through data analytics (Goriunova, 2019). However, little is known about infrastructures that enable location analytics, nor their sociological implications for the social shaping and governance of urban spaces and identities. This is important because of growing sociological discussions of data-driven capitalism, the acceleration of data capital and behavioural surplus in surveillance capitalism, and the political economies of platforms all convergence on theorizing how market logics translate into specific forms of data governance (Beer, 2019; Srnicek, 2017; Zuboff, 2019).

Understanding how data is imagined and appreciated in relation to specific institutional objectives for competitive advantage is a key component of the socio-technical construction of data markets (Beer 2018). For sociologists, this is important because the calculative operations of location analytics reflect a broader spatial and mobile turn in data-driven consumer governance towards relational epistemes (Sheller, 2017). Theoretical debates often restrict the material analysis of consumer surveillance and commodification within particular digital enclosures, platforms and user interfaces. While important, these analyses can neglect how infrastructures of digital marketing are increasingly operating beyond specific platforms through analytical convergences between people, places, and media by third-party data licensing and analytics that recently have become flashpoints of regulatory concern such as GDPR. New analytical frameworks for understanding the intersection between physical and digital spaces are likewise needed to theorize the political economies of contemporary socio-technical relations (Willems 2019). Finally, material configurations of telecommunications and data infrastructures are often sustained by

business-to-business enterprises and ecologies that tend to remain unexplored yet play a significant role in shaping socio-technical practices of data production (cf. Wilken 2019).

To address these issues, this article examines the social shaping of relevance through location analytics. It argues that the availability of location data reconfigures relevance through new socio-technical assemblages of the built environment that extend the logics of behavioural advertising into urban environments. Subsequently, marketers, brands, and retailers increasingly imagine consumers as mobile subjects governable through location analytics platforms that intersect with the broader political economies of algorithmic culture, and the imperative to intervene in precise spatio-temporal moments that constitute our everyday rhythms. This can be understood as a *locative imaginary* because it opens up a discussion about the social imaginaries of location analytics being collectively mobilized to organize markets for competitive advantage based on changing values and assumptions of consumer preferences and the role of marketers in extracting surplus value (Beer, 2018; Bucher, 2017; Turow, McGuigan, & Maris, 2015). The locative imaginary, therefore, re-organizes the logics of success and the material politics of data infrastructures in a field of algorithmic practices towards envisioning new possibilities to exploit location for programmatic advertising.

The locative imaginary is developed within an analysis of publicly available business-to-business literature, privacy policies, and industry news; and builds on emerging research that critically unpacks claims of credibility, trust, and authority to govern institutions of relevance through data analytics (Gillespie, 2014; Beer, 2019; McGuigan, 2019). A purposive sample of 54 location analytics companies were identified from relevant digital marketing news and industry associations including the Location Based Marketing Association[3], the Mobile Marketing Association[4], AdExchanger[5], GeoMarketing[6], LUMA Partners[7], and Crunchbase[8]. Although there are some limitations to analyzing marketing and promotional

materials, this methodological approach has become a key technique for mapping fields of data analytics in sociological research (Beer 2018; Simon 2019). Mapping location analytics industries is also becoming an area of public concern. An investigation in 2018 by the New York Times found that at least 75 companies receive anonymous, precise location data from mobile applications for consumer surveillance purposes and has generated important questions concerning the nature of consent and privacy (Valentino-DeVries, Singer, Keller, & Krolik, 2018). Location analytics reveals key shifts in the epistemological politics of contemporary surveillance and data analytics practices in ways that move beyond privacy as an analytical device (Phillips, 2005), towards broader political economies of classification and the social shaping of value through metrological practices of location analytics.

Relevance and Classification in Algorithmic Culture

There is a growing interest in understanding the social implications of data analytics to shape markets, and what these practices tell us about the changing objectives and techniques of contemporary capitalism. Consumer identities are increasingly 'manufactured' by data practices to automate marketing processes and thereby intensify capital accumulation and consumer exploitation (Zwick & Denegri Knott, 2009). Economic forces exert significant pressure to accelerate the collection and analysis of data in everyday life to pursue real-time decision-making processes, and the ways that populations are encouraged to *naturalize* data generation in everyday life through new embodied dispositions and data cultures (Beer, 2019; G. J. Smith, 2018). These processes reflect broader trends in the governance of subjectivity through machine learning, and fundamentally underscores key socio-economic tensions of liberal market ideologies concerning the social shaping of freedom and choice through consumption practices by external market forces (Gabriel & Lang, 2006). Collectively, this

can be understood as a political economy of relevance that shapes specific economic and cultural relations of content production and distribution across platforms.

Platform governance through algorithmic ideologies exerts significant responsibility in structuring relations of production and consumption (Cheney-Lippold, 2011; Mager, 2012). Platforms reflect specific ontological assumptions and aesthetic judgements about consumer lifestyles in digital culture, and the specific roles marketers ought to play in a field of practice to make epistemological claims of knowing consumer insights, values, and desires (Ariztia, 2015; Schleifer & DeSoucey, 2015). One consequence is the expansion of available markets for programmatic advertising by moving away from normative judgments towards algorithmic calculations of lifestyles and tastes, typically through online behavioural analysis for programmatic advertising, the automated buying and selling of advertising inventory through micro-auctions (McGuigan 2019). Advertising infrastructure depends on specific calculative ontologies that transcend human sense-making capacities. These increasingly finite interventions and judgements are constituted through ‘little analytics’ that discards the material context of data extraction (Amoore & Piotukh, 2015). This is governed by a 'data derivative' in which institutional forces imagine and calculate differential curves of normality and potential futures, in effect reconfiguring governance by shifting the focus towards a speculative ontology of possible states (Amoore, 2011; Amoore & Raley, 2017). Contemporary forms of calculation in data analytics industries are indifferent to knowing actual outcomes and are instead focused on predicting potential risks. This signifies a shift away from normative, or disciplinary techniques of power towards the calculation of probabilities, risk, and imagined potentials.

The data derivative is everywhere. Fourcade and Healy (2013, 2016) see social life as increasingly shaped by ‘classification situations’ that constitute a broader economy of moral judgement. This neoliberal economization of society departs from conventional ontologies

towards the intensification of differences in the cultural and epistemological dynamics of markets based on principles of finance (Davis & Walsh, 2017). For Arvidsson (2016) the derivative is the organizing structural logic of platform capitalism investment practices and organizational modes of thought. Platforms such as Facebook are 'embodiments' of derivative financial instruments that are used to classify users into specific cohorts of value through probabilistic calculations. It now constitutes a hegemonic role in the routine practices of identification and classification of social phenomena into intangible assets. Similarly, the logic of the derivative invites deeper sociological questions concerning the relationship between value and values, or the ways that capital seeks to economize every aspect of social life, particularly in digital platforms whereby every action and person is subject to numerous processes of quantification and valuation (Skeggs, 2014; Skeggs & Yuill, 2016). Financial capitalism depends on the constant identification and construction of new assets and markets through processes of aggregation, in effect making it impossible to escape the social logic of capitalization (Leyshon & Thrift, 2007). Platforms become central intermediaries in processes of valuation and capitalization because they are structured and financed by speculative investment that encourages aggressive market expansion to extract monopoly rents (Langley & Leyshon, 2017; Srnicek, 2017).

The financialization of platforms, and the underlying practices of calculation and valuation depend on the intensification of data collection and analytics practices using algorithms. An emerging scholarship has sought to understand the social implications of using algorithms to automate classification practices and their consequences. Routine forms of cultural classification are increasingly offloaded to computational processes such as algorithms, giving rise to an 'algorithmic culture' that influences institutions of performativity (Hallinan & Striphas, 2016; Striphas, 2015). Carah (2017) argues brands are increasingly experimenting with participatory data-driven brand activation strategy to encourage

consumers to engage with algorithmically produced content. Changes in the social relations of media participation reveal how brands and social media platforms are increasingly investing in new practices of experimentation and measurement that reconfigure notions of agency and participation between humans and algorithmic media. This includes everyday dramaturgical performances on platforms, as users internalize how algorithms structure visibility through an 'algorithmic imaginary' (Bucher, 2017). Put differently, the algorithmic imaginary reflects specific changes in how users negotiate themselves as sociologically *relevant* subjects for platforms by internalizing particular forms of conduct into a habitus that maximizes visibility.

These negotiations engender key questions concerning the nature of algorithms for population governance and surplus extraction. For Rouvroy and Berns (2013), we are seeing the emergence of 'algorithmic governmentality' to produce 'eminently evolving relations between various measurements that are not reducible to any average' (p. 4). Algorithmic governmentality presents subjects as a series of measures and quantifications of behaviour that fragments reality into a metricized, unmediated, and monadic ontology. It is indifferent to individuals but instead focused on investing in statistical metrics of relations typically collected through extractive processes in which subjects are unaware of its magnitude. The implication is that the logic of algorithmic functions extends into a cognitive and performative language that organizes production and consumption processes through recursive functions (Totaro & Ninno, 2014). These social forces extend beyond digital platforms and are increasingly embedded throughout the built environment, presenting new questions for understanding conventional ontologies and epistemologies of classifying subjects through ubiquitous forms of urban sensing, tracking, and classification (Crandall, 2010).

Algorithms reconfigure processes of personalization and individuation towards 'a-typical' pathways, such as through recommendation systems that continuously track and analyze online consumption behaviours to develop new categories of preferences which are themselves subject to modification and re-interpretation (Lury & Day, 2019). The ontologies of classification are reconfigured by a cultural topology of transitive modes of relationality (Lury, 2013). This has manifest across spheres of cultural production. Beer (2013) argues that contemporary forms of cultural classification, genre production, and boundary drawing are occurring in conjunction with decentralized social media, particularly as folksonomies and new taxonomic practices facilitated by social media platforms are embedded within a broader 'classificatory imagination' that multiplies the possibilities of genre and boundary production across a field of cultural production. This also is reflected in sociological debates about 'post-hegemonic' modes of cultural production and classification through data analytics and participatory practices (Beer, 2009; Beer & Burrows, 2013; Lash, 2007).

The collection and classification of data to represent particular cultural phenomena for surplus extraction has significant political implications that are increasingly gaining critical attention. For Esposti (2014), 'big data' is structured by marketing and corporate discourses that frame data analytics and techniques of 'dataveillance' as a panacea to many economic and political challenges. The marketization of data analytics re-frames particular social issues as data problems that require the increasing collection and analysis of big data. Data analytics has also become instrumental in reshaping political campaigning and leading a growing concern of undermining democratic processes exemplified by the Cambridge Analytica scandal and the growth of populist politics (Simon, 2019; Tufekci 2014; Nadler et al., 2018). Beer (2017b, 2018, 2019) argues that the data analytics industries reveal changing beliefs in credibility and authority for governing social phenomena through specific rationalities and imaginaries of data analytics. This includes understanding the social meanings and

rationalities of speed and 'real-time' decision making that data analytics offers because of the sheer competition and intensity facing global corporations and cities (Beer, 2017a; Kitchin, 2014b). Social and economic forces not only exert pressure to accelerate the collection of data but also its commodification. As decision-making is increasingly subject to these forms data-driven governance, the specific methods and forms of scientific comprehension become increasingly specialized and privileged as intellectual property to maintain a competitive advantage. Understanding the social imaginaries of data analytics has become a key programme for sociological research into the impacts of big data. However, recent investments and social interest in location analytics are relatively unexamined but have clear potential to rethink how the social logic of algorithms is increasingly spatialized in an effort to extend the logics of behavioural advertising into the governance of urban life.

Commodification and Cleansing

The locative imaginary depends on investing specific meanings into the social relationship between people and place that can be ascertained from the statistical analysis of location data. Over a decade has passed since sociologists began to draw attention to the spatial dynamics of classification by analyzing commercial software used for geodemographic clustering that allows for the classification of populations through postal codes (Burrows & Gane, 2006). These systems automate the reproduction of class hierarchies through ideal types and demonstrate the important - if often unacknowledged - role of commercial sociology in applying social science methods in the service of capital (Savage & Burrows, 2007, 2009). The social logic of classification shifts away from conventional sociological variables and personal characteristics such as age or gender towards spatial clustering and typification to predict specific behaviours (Webber & Burrows, 2018). In the intervening ten years, the scope and scale of spatial data production have dramatically

increased through smartphone technology and location-based services (de Souza e Silva & Frith, 2010). This has led to emerging discussions of how these technologies reconfigure the logics and practices of spatial classification. The adage 'you are where you live', is being challenged by a second-order geodemographic provocation: 'you are where you go' (Barreneche, 2012; Smith, 2019; Thatcher, 2017). This adage highlights important epistemological shifts in the production of geodemographic classification systems through a locative aware future where governance is 'geocoded' through big data analytics (Barreneche & Wilken, 2015; Crampton et al., 2013; Wilson, 2012).

There are different techniques by which location analytics companies can obtain location data and valorize the surveillance process. Sometimes this happens through direct user consent. For example, *Placed* utilizes a panel-centric methodology whereby users download a *Placed* owned or affiliate application that monitors their location in exchange for points that can be redeemed for gift certificates or donations to charity. In effect, *Placed* depends on the commodification of behavioural surplus labour whereby users consent to ubiquitous surveillance, in exchange for a tokenistic reward that is at the sole discretion of *Placed*. Users are required to submit demographic data and are routinely encouraged to complete surveys for additional compensation. *Placed* claims this yields billions of data points through continuous monitoring of user locations that are joined with demographic information provided during registration. The myriad of signals received is then subject to statistical normalization and clustering to infer the likelihood a user visited a specific location (Placed, 2014).

A more established technique for location data extraction (Barreneche & Wilken, 2015) is through data partnerships and Software Development Kits (SDKs) that passively extract data from specific events such as automated advertising networks to programmatic ad networks (McGuigan, 2019). These SDKs operate within mobile applications as a marketing

'stack': an assemblage of different software providers and data services that marketers collectively leverage to automate the production and analytics process (Koo, 2016). Users are typically not aware of the magnitude of these invisible surveillance processes that extend beyond the interface (Valentino-DeVries et al., 2018). Instead, this technique of data extraction is usually stated in a generic language in the privacy policies of specific publishers, applications, and platforms. For example, *AccuWeather's* mobile application states clearly in its privacy policy that user data may be disclosed to both 'affiliated companies' *and* 'unaffiliated third-party providers'[9]. These affiliated and non-affiliated companies can include partnerships between advertising networks and location analytics vendors to enhance the analytical precision of audience commodification, allowing advertisers to reach increasingly specific audiences based on inferential knowledge of their location patterns. For example, in 2014 the Spanish advertising network *TAPTAP* began licensing location data to *Locomizer* in exchange for geo-behavioural profiles of its audiences. This partnership enables the production of geodemographic knowledge by translating location histories obtained across an advertising network into distinct profiles for ad targeting that, as stated in *TAPTAP's* privacy policy, permits data sharing with other clients and service providers[10]. In effect, the infrastructure of location analytics is designed specifically to maximize the commodification and exchange of spatial and behavioural data during advertising events.

This political economy of data infrastructures encourages data licensing partnerships and vertical consolidation using data resolution services, creating assemblages of multiple service providers within a marketing stack. For example, *Gravy Analytics* (2017) is in partnership with *adsquare* to provide location-based audiences for *adsquare's* audience management platform. In order to further strengthen its analytical precision, *Gravy Analytics* (2018) partnered with *PeerLogix* and *LiveRamp* (formerly *Acxiom,* a major American data broker) to create new audience segments through identity resolution and 'data onboarding'

services: the merging of discrete datasets to create holistic profiles of audiences, such as by combining music streaming or television programming data with location histories to intensify profiling and measurement beyond specific platforms towards 'people-based marketing' solutions (Smith, 2019). These forms of data consolidation are built-in to the logic of advertising infrastructures as the social shaping of subjectivity is quantified by empirical metrics of delivering *relevant* content to geocoded audiences, offering a monetary incentive to publishers to extract and share location data with ad networks. The IAB (2016) estimates that networks charge 20-30% higher Cost Per Mille (CPM) rates for audience segments geocoded by location data. Claims of relevance are therefore governed by a political economy of audience commodification that is intensified by location analytics platforms, particularly as platforms such as *Locomizer* can negotiate percentage cuts from advertising revenue. This encourages the acceleration of data sharing across multiple vendors that offers specific solutions for manipulating data to demonstrate that relevant audiences are being delivered to the right client and at the right moment.

Finally, location analytics verify and cleanse location data through statistical techniques that remove anomalies and identify correct patterns of consumer mobility. Put differently, this process involves making audiences docile subjects such that they can be governed as predictable economic actors. For example, in 2018 *Locomizer* partnered with *HERE,* a geospatial mapping company, to refine the processes of data ingestion and cleansing to ensure that audience profiles remain accurate and relevant for advertising networks: 'In cooking it is important to have your ingredients fresh, and likewise in our geo-behavioural analysis, POI [Points of Interest] database needs to be 'fresh' in order to provide powerful consumer insights to our customers' (Locomizer, 2018). The locative imaginary hinges on translating spatial data into economically meaningful targets for behavioural advertising through geocoded governance (Barreneche 2012). This logic extends into the processes of

disciplining audiences as governable subjects through spatial analytics using predictive algorithms. *Locomizer* claims to have developed the first 'biology inspired algorithm' rationalize their analytical framework because 'location is identity'.

The governance of 'fresh' geospatial data further encourages multiple strategic partnerships with data producers and analytics platforms to deliver relevant subjects to advertisers. The locative imaginary is sustained by *performative* calculative frameworks based around dialogical measurements of precision and accuracy necessary for the political economy of relevance. Simply having precise spatial co-ordinates does not necessarily translate into accurate insights about consumer intent. This data must be carefully scrutinized by proprietary algorithms that control for error and map them as tangible insights that translate into economic opportunity. Incidentally, the rhetoric of data cleansing also reproduces narratives of sociological complexity in understanding global flows by 'black-boxing' the processes of algorithmic governance (Pasquale, 2015). *PlaceIQ,* for example, uses its proprietary 'Darwin' filtering technology to calculate the 'Hyperlocality' and 'Clusterability' scores to not only segment audiences, but measure desired responses to advertising exposure (Smith, 2019). *NinthDecimal* employs its 'LocationGraph' trademarked technology to filter and cleanse over a billion data points obtained by first and third-party sources. Metaphors of 'cleansing data' to ensure the correct relationship between precise spatial co-ordinates, and *accurate* knowledge of consumer dispositions, therefore, provide multiple analytical functions that perform credibility by over-simplifying complex socio-technical relations with telecommunications infrastructure into linear epistemologies of consumer dispositions. Namely, by naturalizing the relationship between location histories and anticipated futures as necessarily ordered and discoverable hidden insight. The unobtrusive quality further adds a degree of scientific authority and *neutrality* to location

analytics. Unlike major platforms that seek to influence, location analytics plays the role of a passive observer, uncovering hidden insights at a distance, and for a price.

Thresholds of Relevance

The actualization of the locative imaginary into material instances of consumer governance has the potential to reshape the design and ordering of urban environments and subjectivities in ways that intensify the thresholds of relevance available to digital marketing. Location analytics is specifically concerned with how mobile bodies are made into governable subjects for geo-targeted content and 'contextual intelligence' solutions that offer the promise of disrupting existing marketing practices by creating new social topologies of spatial differentiation, and new categories of class-identities through relational epistemes. The *Esri* location analytics platform, for example, claims to offer customers a more 'intimate' connection with consumers through 'faster and deeper insights' enabled by spatial visualizations of marketing datasets (Esri, 2014). Typically, these platforms will frame location analytics as complimenting or augmenting existing data through statistical analysis and visualization to realize deeper and more relevant insights. Locations in and of themselves are of limited potentiality. It is through pattern recognition that relational taxonomies are possible. 'Unlocking the potential of location' by 'connecting the dots' (*Moasis*) is a key theme of location analytics necessary for predicting consumer paths to purchase. These relational claims are typically accompanied by spatial metaphors that equate location analytics with the analysis of online clicks and paths-to-purchase. For example, vendors claim to offer marketers the ability to 'bridge the gap' between online and offline behavioural targeting (*Digital2Go*). Connecting and bridging processes shows how the ontology of spatial classification depends on topological metaphors of nodes and tracing paths to reveal the hidden insights by correctly mobilizing databases as inscription devices for identity

governance (Ruppert, 2011, 2012). Contextual intelligence depends on the assumption that the spatialization of digital subjectivities will yield unique and more authentic attributes of consumers necessary for the machinery of commodification in platform capitalism (Zuboff, 2015, 2019).

This spatialization of relevance also depends on identifying the body-in-space to add further credibility by knowing the embodied relations between people, places, and media. Interestingly, this engenders new intersections between online and offline media whereby digital marketers are increasingly imagining consumers as mobile subjects accessible through portable devices. The locative imaginary encourages marketers to reproduce the logic of online data extraction in offline contexts by conceptualizing influence through precise spatio-temporal events, in effect creating new intersections of digital and physical environments. For example, the equivalence between location analytics and online web tracking methods to metricize online behavior are frequently leveraged to legitimate new methods of consumer tracking because location is seen as the new ‘cookie’ for the offline world that can anchor analytical practices and rationalize location analytics within convergent media infrastructures (Helmond, 2015; Shields, 2014). *Blis* describes their platform as 'Phy-gital' and encourages brands to develop omni-channel media strategies that combine brick-and-mortar retail environments with mobile media. *Swirl* argues that retail spaces can be transformed into a 'valuable digital asset' through indoor location analytics that tracks smartphone movements using Beacon and WiFi sensors. In 2017, *Swirl* partnered with *AccuWeather* to create customized and ‘hyper-local’ in-store promotions based on current weather conditions. This could be used to alert users to rising pollen counts, provide special offers for allergy medication, and track a recipient of that geo-targeted offer to observe changes in movement behaviour (Williams, 2017). This simple example reveals the multiple processes of data analytics, geo-targeting, and measurement that are necessary for the locative imaginary,

while also serving to idealize the structural conditions of relevance in mobile digital culture and thereby redefine what marketing success should look like in hybrid spaces. Likewise, larger players such as *Amazon* are experimenting with location analytics for reconfiguring the entire path-to-purchase in retail such as *Amazon Go*: a 'store of the future' that utilizes an array of in-store sensors to automatically track movements of people and goods thereby removing cashier check-outs (Wingfield, 2018). These enclosures intensify surveillance in the service of optimizing logistical operations, investment strategies, and claim to boost consumer satisfaction and loyalty (Esri, 2013). *Starbucks* is also personalizing retail space by measuring consumer behaviour specific to individual store locations (Bhattacharyya, 2019).

The locative imaginary transforms the ways brands mediate urban environments through new experiential strategies of consumer engagement and the production of relevance. Media campaign planning is also embracing the locative imaginary in ways that do not necessarily depend on generic geotargeting or geofencing strategies. For example, *Locomizer* helps brands determine media purchasing strategies by scraping geo-coded Twitter content to inform out-of-home (OOH) media placement. In one example, *Locomizer* calculated future media placement strategies for major video game titles such as *Doom* and *Fallout 4* based on the prominence of geo-coded tweets made by gaming audiences in specific locations in London. Locations, where people were known to talk about video games on Twitter, were selected for billboard and public transportation advertisements because these environments were anticipated to yield higher viewership by relevant audiences. In another example, the client, *Jameson* whisky, wanted to select optimal OOH sites to reach relevant audiences. *Locomizer* applied its proprietary ‘audience discovery engine based on geo-behavioural user interest profiling technology’ by isolated specific locations such as bars, and a particular audience segment, 25-34-year-old men, then calculated other locations known as ‘affinity areas’ this market dwells in before and after visiting bars. Media inventory was purchased in

locations both in proximity to bars *and* affinity areas, in effect, using a locative imaginary to enact relational epistemologies of consumer lifestyles that can be exploited for competitive advantage. These strategies do not simply use audience 'retargeting' techniques that target already-known audiences. Instead, these strategies depend on anticipatory logics of the relationship between branded spaces and specific consumer practices. Advertising placement strategies in the urban environment are increasingly becoming enmeshed with measurable digital behaviours that create a feedback mechanism for location analytics and the classification of relevant people, places, and media. Beyond media, location analytics is informing the design of urban spaces including retail placement and optimization strategies. *You are where you go* is refracted back onto the socio-technical construction of urban space through an anticipatory calculus of prediction.

These media campaigns depend on 'hybrid' spaces that push the thresholds of relevance to increasingly precise spatio-temporal moments and audience segments (de Souza e Silva, 2006; Frith, 2012). *Google* argues that marketers should re-imagine mobile marketing as 'micro-moment marketing' because of the affordances of geo-contextual search that offers new opportunities to target and intervene in the real-time decision-making processes of everyday life (Ramaswamy, 2015). Here, relevance is accelerated by location analytics by spatializing behavioural advertising in specific moments and spaces. The ontology of consumer agency shifts towards the governance of mobile and reflexive information-seeking subjects. These analytical practices reflect larger cultural economies of contemporary subjectification, particularly in ways that try to negotiate consumer agency, reflexivity, and multiplicity of relevance. Taxonomic possibilities multiply rapidly as data licensing and consolidation allows for new combinations of analytical knowledge.

Micro-moments depend on knowing increasingly precise geodemographic segments by spatializing behavioural data and inferring relevant demographic attributes and consumer

intent through data analytics. Location analytics platforms routinely appeal to the absolute number of data points and audience segments to add credibility to their analytical power. *GroundTruth,* for example, boasts 4,500 unique audience segments by receiving location data from 700 million monthly users across 100,000 mobile applications. This allows for an unprecedented degree of flexibility in audience commodification and discrimination. *Factual's* ‘Geopulse Behavioural Audience Segments’ describes the 'Affluent Consumer' segment as people who visit high-end luxury retail stores such as Club Monaco, Coach, or Louis Vuitton, a location history that suggests incomes over $120,000, and interested in purchasing the latest seasonal fashions. Statistical algorithms process new location patterns to refine and strengthen the segment. *NinthDecimal's* 'Healthy Living' segment is produced by clustering general location characteristics, such as those who frequent gyms, spas, and athletics clubs, but also shop at natural food stores and healthy grocers. Both *Factual* and *NinthDecimal’s* geodemographic segments reveal complementary strategies of brand mobilization by algorithmic culture. While *Factual* concentrates on establishing relationships between specific retailers and brands, *NinthDecimal* employs semantic correspondences between general classes of locations and embodied practices. The locative imaginary both assembles and deconstructs the relationship between people and place through algorithmic practices of aggregation and de-aggregation to establish relational understandings of embodied practices (Lury & Day, 2019). Clients specify exactly what kind of 'real' person they desire the infrastructure to make ready as subjects for programmatic advertising. At the same time, this allows for different pricing mechanisms, such as towards subscription-based models whereby advertisers pay monthly fees for regular access to specific markets. This could potentially generate new hierarchies of worth whereby access to lucrative markets such as 'Affluent Consumers' or similar segments rich in economic capital are priced along with premium models, although this is a subject for future research.

The expansion of geodemographic profiles based on the longitudinal analysis of location histories encourages the continuous extraction and consolidation of location data through data management platforms to further refine segmentation. Platforms organize behavioural data from multiple vendors and provide both pre-defined audience classifications and customizable audiences that can be applied to a preferred media buying platform, allowing brands to control the conditions of subjectification for digital advertising through 'self-serve' audience platforms. This does not simply mean that marketers select audiences in 'real-time' and micro-moments. Instead, vendors see location as a mechanism to segment consumers into aggregate clusters for new geodemographic insights based on assumptions that location signifies both context and consumer intent (Laband, 2015). This allows marketers to *predict* future behaviours by speculating where people will go, and the advertisements they will likely be receptive to. For example, *Google's* GPS navigation platform *Waze* is now investing in 'destination-based marketing' that predicts future mobilities. A subject observed at a basketball game could be targeted with restaurant and bar adverts located near the sporting arena in a bid to influence their next destination (Williams, 2019). These logics work through statistically calculated spatial correspondences of embodied consumer practices and anticipated futures situated in branded urban space.

The continued investment and appreciation for location in digital marketing has not gone unnoticed by mobile carriers who sit on vast troves of valuable location data. In the U.S., four carriers have been reported to sell location data to *Locationsmart*, a marketing company (Valentino-DeVries et al., 2018; Whittaker, 2019). Once sold to a third party, this data can then be repackaged and marketed to other interested parties, including law enforcement who can circumvent the need for a warrant to obtain location directly from carriers, credit agencies, and bail bond companies (Cox, 2019). Carriers also own mobile advertising exchanges and audience marketplaces in a gambit to penetrate mobile advertising

markets. In 2014, Spanish carrier *Telefónica* launched its own ad exchange *Axonix*, a 'programmatic discovery platform' by purchasing *MobClix* advertising technology from *Velti*. *Axonix* has sought to secure market share through strategic partnerships and acquisitions, including the purchase of British mobile geolocation data startup *Statiq* in 2017 to expand its data onboarding and analytical expertise (Connelly, 2017). Swedish carrier *Ericsson* offers carrier-verified location-based audiences and measurement solutions through its subsidiary *Emodo*, who is also in partnership with *Axonix.* These patterns of acquisition and investment in 'first-party' carrier data are particularly important for understanding how wireless telecommunications infrastructure experiments with data brokerage and location-based marketing. As investments in emerging high-speed and low-latency infrastructure such as 5G continues, carriers will likely be in an ideal position to accelerate the precision and scale of location analytics for marketing.

Conclusion

Location may become the most vital dimension for emerging techniques of consumer identification and pattern recognition. If the location analytics industry continues to gain traction, it is important to consider its sociological implications in terms of how populations will be ordered and classified for political and economic applications, and more importantly, how these systems will impact the everyday experiences of living in cities and our interactions with institutional forces that can potentially track and predict movement. Beyond marketing applications, location analytics are being experimented with in political campaigns. For example, the *Our Data Our Selves* project organized by the *Tactical Technology Collective* follows how political campaigns are leveraging geotargeting methods to influence voters in micro-moments[11]. It would seem then that knowing where you go will

increasingly characterize the structuration of identity by various power forces hoping to influence shopping and voting habits.

The sociological importance of understanding data analytics and algorithmic culture is well documented, but the impacts of location analytics are still quite nascent. The locative imaginary helps theorize how the logics of data analytics accelerate digital techniques of consumer surveillance, profiling, and measurement onto embodied dispositions through hybrid spaces, ubiquitous media, and emerging smart environments. This signifies an emergent and unobtrusive form of subjectification for behavioural surplus extraction that has attached itself to the machinery of algorithmic advertising and surveillance capitalism. If this proves profitable, we will likely see an intensification of identifying and classifying bodies in specific 'micro-moments' of opportunity to intervene in daily rhythms. Commercial and political forces may increasingly shift their attention from knowing where you live towards where you go, and increasingly through an anticipatory calculus, where you will likely go. The urban environment is also changing to reflect this calculus whereby the first piece any marketer or platform will start with is knowing where you are.

The locative imaginary claims the body-in-space for data extraction. It is authentic, truthful, and credible in revealing the habitus of lifestyles. Significant monetary incentives built into the infrastructures of digital marketing are accelerating location data extraction and licensing and in turn new opportunities for consolidating data obtained by multiple sources that bridge online and offline environments. Location analytics vendors are therefore central beneficiaries that profit from ordering complex spatial and behavioural data and translating this into tangible 'real-world' insights. Likewise, we may well see mobile carriers increasingly behaving like marketing consultants and advertising networks. These practices operate through relations of media, bodies, and space that can reshape the design and

phenomenology of urban life towards new thresholds of relevance. Such experiments of accelerating relevance in everyday life are, or may soon be, increasingly difficult to avoid.

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