THESIS

#WHEREAMI?

THE SYNERGY OF SOCIAL MEDIA ENGAGEMENT AND CARTOSEMIOTIC CONDUCT

Submitted by

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ABSTRACT

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This thesis presents a multi-quantitative study to describe and analyze the synergy of map language, or cartosemiotics, and social media engagement. In addition to an extensive literature review of cartosemiotics and social media, a content analysis of social media posts and an online survey of social media users were implemented to define Social Cartosemiotic Conduct (SCC). This conduct is primarily sharing a combination of #[location] and emoji on social media, to indicate both a place or geotag and a corresponding symbol to represent that place. While identifying this map language on social media, the effects of this communication were also determined, specifically in relation to user concern for privacy, spatial awareness, and social perspective. Although the survey data from the collected convenience sample was not representative of the randomly sampled content analysis data, the individual method results, as well as the data similarities between each method, showed relationships that could influence: market research procedures, how geographers landscape place, an understanding for a new form of geo-centered Computer Mediated Communication, as well as how individual privacy concerns are becoming more collective as technology from multiple disciplines are advancing and synthesizing.

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Last, but not least, thank you Mom, Dad, and Elise—This journey was, and still is, amazing because you are always there for me.

DEDICATION

This thesis is dedicated to:

My Dad, Darren—
Who taught me, among many cherished life philosophies, how to eat an elephant.

My Mom, Lori—
Who inspires strength and passion, and whose hugs are irreplaceable.

My Little Sister, Elise—
Who knows me better than anyone. #PineconePiggyBacks to #PoolHeadDunks

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CHAPTER 1. INTRODUCTION

From hand-drawn cartography, to Geographic Information Systems (GIS), to social media features, maps have always been a medium for users to seek information about their surroundings. This medium, print to digital, has advanced individuals' ability to express and understand spatial awareness, as well as the context underlining each communicated space that relates to individual or communal social perspective. As digital modes of this media have expanded over time, priority and concern in sharing locations across online communication platforms have influenced how individuals view privacy and corresponding safety awareness. Although these constructs are relevant to the design and study of cartography, maps are mutually perceived as objective documents that strictly depict physical or geographical proximity. However, if we examine a brief example of cartographic evolution from ancient cartography to mapping features in social media, map design and language present influential and multimodal communication. Literature in cartography and geography presents how participatory mapping and social cartography can influence respective users' perceptions and behaviors (Pickles, 1995; Pavlovskaya, 2016; Lin, 2013; Van der Woude, 2008; Garfield, 2013; Wood, Kaiser, & Abramms, 2001; Monmonier, 1991); and social media communication literature presents how respective users' perceptions and behaviors are influenced (Fischer & Reuber, 2010; Turkle, 2012; Bryant & Oliver, 1994; Baran & Davis, 2013; McQuail, 2010); however, there is little explanation of the effects when these two realms of information communication combine in online spaces. This study strives to fill the gaps in literature between social media engagement and social cartography, and the overall goal of this study is to analyze a specific realm of social media behavior influenced by cartographic features and language.

1.1 Evolution of Cartosemiotics

Cartographic statements shift over time in order to adapt to societal changes (Garfield, 2013; Pickles, 1995), and some maps act as a vehicle of opportunity for certain groups in society to progress. Simon Garfield (2013) explains how ancient maps were created to adhere to the mind of their users. He elaborates how the first *Mappa*, c. 1290 (meaning cloth napkin in medieval times) was "a guide, for a largely illiterate public, to a Christian life" (Garfield, 2013, p. 43). This map, as an example of cartography of its time, was a decorative map that exhibited the Last Judgement, and the two sides of the map face showed contradicting settings: one of paradise, and one with demons and dragons. This use of monstrous semiology as placeholders for unexplored lands/seas directly inclined voyagers to demonize indigenous races within colonial literature (Garfield, 2013). Therefore, this map was a persuasive medium used to visually steer mediaeval citizens toward Christian culture through semiotics. Although technology and global knowledge has advanced since c. 1290, symbols are still a foundational element in cartographic design (Peterson, 2015) and have simultaneously become more prominent in our means of Computer Mediated Communication (CMC) to amend the lack of visual cues.

The study of semiotics emphasizes the "relationship of signs or symbols (i.e. word, sound, image), their contextual meaning, and how the public or specific viewer(s) interact with such meaning" (Gaines, 2010, p. 7). *Cartosemiotics* is a specific realm of semiotics in which the signs, symbols, and corresponding rhetoric portrayed on a map is studied. This study will focus on cartosemiotics from the perspective of the following definition: "Map language from the standpoint of modelling, communication and cognition with the goal of acquisition of new

spatial knowledge or re-vitalization of forgotten spatial information" (Wolodtschenko, 2003, p. 1977). This study will also consider the following themes of cartosemiotics:

> Map symbolism, or map language, that is, the type of sign systems that are manifested in individual map faces; marginal notes; peripheral signification phenomena; the process in which humans handle signs, or sign processes for short; the context in which signs and sign processes are embedded. (Schlichtmann, 2003, p. 1)

Mapmakers used to be subjectively inclined to embed cartosemiotics that communicated their own biased context of the world, before global exploration and technology influenced a push for a more accurate, democratically accepted communication of the world. This bias is now driven by selective purposes that maps convey to specific audiences; "In geography, studies of perception of environment, behavioral environment, and environmental cognition have come to enjoy increasingly popularity" (Porter & Lukermann, 1976, p. 198). Porter and Lukermann (1976) as well as Wood, Kaiser, and Abramms (2001) agree that maps are created with subjective conceptions to design unique experiences; specifically, "the study of geographical knowledge, or *geosophy*, covers the geographical ideas, both true and false, of all manner of people—not only geographers, but farmers and fisherman, business executives and poets, novelists and painters" (Porter, & Lukermann, 1976, p. 197; Wright, 1947). One of the goals of this study is to show that social media users belong in this list of people who are integral to the idea and communication of geosophy. Wood and colleagues (2001) further this cartographic selectivity by suggesting "we should have put 'world map' in quotation marks [because] every map serves a specific purpose [and] every map advances an interest...the name 'world map' is convenient but keep in mind that a great deal is missing [and] often what's missing is a clue to the purpose the map is serving" (p. 4). Despite a shift in technology, maps are still made "of our experience patterns, as an inner model of the outer world, and [used] to organize our lives"

(Kepes, 1967, p. 67). Media communication scholars state that social media engagement and other forms of CMC are channels that also result from our collected experiences, or schema, and are used to express individual 'models', in order to understand or connect to the outer world.

This overlap reinforces that cartography is a social construct, but historical mapmakers' hand in designing the world also proved society as a cartographic construct. Since ancient cartographic design was usually in the hand of one or a few men, the information maps presented about viewers' surroundings exuded hegemony that influenced how a world or culture should be understood, which affected societal perceptions and how one interacted/interpreted their surroundings (Garfield, 2013; Van de Woulde, 2008). Even once technical approaches to modern mapmaking commenced, such as GIS, relative scholars like Pickles (1995) expressed that cartography still contained this hegemonic visual rhetoric that resulted from manipulation of interpreted data. Furthermore, current maps are fashioned more accurately in terms of spatial representation across global landmasses with precise proportions, but all mapmakers still make decisions about what shall be mapped and what shall not be mapped. For example, contemporary maps can "represent unwieldly territories as tidy, governable units and, in so doing, [maps] function as political and ideological tools of empire" (Van der Woude, 2008, p. 1074). Monmonier (1991) also presents the truth about how cartography and advertising have commonalities due to their "need to communicate a limited version of the truth" (p. 58). For example, "advertising agencies serving airlines can have a great fun with maps, [as they] decorate maps with pictograms of impressive skyscrapers, museums, golfers, girls in bathing suits, and other symbols of culture or leisure...by manipulating maplike images" (Monmonier, 1991, p. 63). Monmonier (1991) also indicates that the same cartosemiotic strategies are forwarded for purposes of propaganda, as well as the creation of data maps to show consensus in

rhetorical ways. If we think about how social media accessibility is used by the public as a vehicle for political, ideological, artistic, and self-expression, a clear overlap in social media engagement and social cartography is apparent. The evolution of both cartographic expression and CMC indicates that cartosemiotics and social media engagement yield a rhetorical power that mapmakers and social media users have manipulated in different ways overtime, in order to portray the world according to political and cultural status or power.

Cartosemiotics have evolved onto new platforms that create a narrative of the surroundings in social media. In contrast to hegemonic cartography, social cartography has become more prominent, as technology has created more and different opportunities for individuals and groups to socially interact digitally. Since new cartography and GIS is based mainly in digital realms, cartography has inevitably been mediated by social interactions and in some cases cartography supports social interactions (Carvalho Di Maio, Gomes, & de Lourdes Neves de Oliveira Kurkdjian, 2011). Specifically, social cartography can:

> Serve as a support to the social interaction processes and participative-action of most distinguished social agents on their way to a gradual reversal of the social alienation or lack of information processes, particularly to processes of political inequality and social and spatial segregation. (Carvalho Di Maio, et. al., 2011, p. 39)

For example, social mapping supports social interaction because users can create, add, and maintain spatial information and corresponding social or political contexts in their social media posts. Quiring (2015) notes that, within virtual interactions, "[people] apparently seek to make...digital worlds behave more like the physical world, [and] the preference for proximity indicates a close relationship between the approximation of voice and social interaction" (p. 11). Even though individuals interact digitally in the online realm, they strive for tangibility by simulating real space or proximity in digital places. With mapping an increasingly social

phenomenon, a surplus of information about societal and worldly surroundings becomes easily and visually accessible on social media. For example, social media users can use platform features to geotag their shared pictures and/or posts, modify their shared content with more geotag variations by adding a hashtag and location (i.e. #FortCollins or #DownTown), and even supplement their geotagged posts using semiotic capabilities like Bitmoji or emoji. Emoji are contemporarily viewed as signs or symbols that present a meaning-making ability in online communication that transcends cultures and technical lexicon (Danesi, 2017). Bitmoji are an even newer version of these symbols that take on personable traits and identity as constructed by the user who shares them. Social media users' ability to create and share symbols within online platforms communally changes and adds to map language. Other interacting users, in turn, engage in this communication via symbol creation of their own; therefore, I define this process as *social cartosemiotic conduct.*

1.2 Social Media and Cartosemiotics

Social cartosemiotic conduct (SCC) expands social media platforms in ways that prioritize the communication of spatial information in terms of physical location and context, and the optimization of the semiotics that platforms allow via emoji, bitmoji, and images. Specifically, Lin (2013) presents a study that reveals "special moments of mapping and the construction of spatial narratives" (p. 51) that can translate to the cartosemiotic narrative converging in social media messages. Digital media convergence was originally the process of digital media and technology displacing traditional and print media practices that placed demands on anyone who communicated information within their profession (Seel, 2012). Digital media transcends all traditional media and is now advanced and implemented to combine practices across disciplines, such as cartography and social media, to create new multimedia practices and theories.

Similar to the original digital media convergence, the idea of hypermedia continues to inspire and revolutionize media communications in how it augments different experiences as well as the real with unreal. Seel (2012) recalls witnessing hypermedia for the first time that visually and realistically portrayed of Aspen, Colorado, during the 1900s which was breathtaking to audience members—he states that "the map designers had created a multilayered, multimedia profile of Aspen that included [specific elements of the ski town] and the navigational map overlay" (Seel, 2012, p. 238). Moreover, we often relate the digital convergence and rise of technology to a powerful mediation capable of changing identity, society, the marketplace/professions, etc.; however, this evolution in communication with digital media primarily advanced how we appreciated, understood, and visualized place. The new ability for society and scholars to communicate place and space in such intricate ways via hypermedia convergence changed how we place concern on privacy in location, as it has now become a controversial, yet desirable, setting on all mobile devices and feature on social media platforms. The degree of individual spatial awareness has also been tested by this prominence of sharing location on social media platforms, since users could potentially gather and analyze their surroundings from the comfort of their home, scrolling through social media feeds and posts relating to surrounding parks, schools, restaurants, businesses, etc. Since there is a possibility for this individual evaluation of spatial surroundings through a strict lens of social media posts, there is also a test for social perspective in how individuals rely on cartosemiotics in social media posts to confirm their biases, or make societal assumptions based on a collective social media movement that specifies the context of a location/place.

Furthermore, what has and still excites communication technology experts, according to Seel (2012), is the "vivid demonstration of the use of multiple layers of media to augment human

understanding of place and its history" (p. 238); the interesting addition to this demonstration is how normal individuals have become a part of this multi-media construction through social media platforms in order to define spatial and contextual place, as well as how it will be studied in future communication history.

Gunkel (2007) emphasizes many individuals who share different perspectives and knowledge in different disciplines all had this one similar concern for the digital divide, or—from Gunkel's (2007) perspective— the idea of unequal distribution of information communication technologies (ICT). This divide exists in critical cartography as well, since only individuals knowledgeable or interested in spatial relations will acquire proficiency in developing spatial communication technology. Since social media is a public domain that more and more countries are starting to acquire for information seeking and relationship building, it is a platform that provides features that allow users to cross digital divides from areas outside communication; for example, individuals might not have the access or ability to partake in social mapping or GIS skills (spatial ICT), but their understanding of hashtags in posts indicating location, and the efficiency of emoji symbols to add context, shows how cartosemiotics in social media communication can be cross-disciplinary and overcome some digital divides. Sui and Goodchild (2001) add that GIS can be generally known as a mass media[1] instrument now that it has converged with social media disciplines. This spatial ICT "communicates geographical information in digital form, [which] illustrates its consistency with contemporary media" (Sui & Goodchild, 2001, p. 388); in contrast, GIS is widely used to analyze spatial data, however, the overall goal of using this spatial ICT is to communicate information to large audiences (Sui &

[1] "Media are generally understood as means of sending messages or communicating information to the general public, and mass media are the instruments by which mass communication takes place in modern society" (Sui & Goodchild, 2001).

Goodchild, 2001). As GIS permeates society as a communicative media, there have been connections made between GIS, parallels in cartography, communication theory, and even linguistic perspectives (Sui & Goodchild, 2001; Tobler, 1979; Frank & Mark, 1991) to discuss trends of language in GIS and cartography. This language has evolved to include location hashtags and emoji semiology on social media platforms through social cartosemiotic conduct.

In a study that examines this spatially semiotic communication online, Caquard (2014) concludes that "The cartographic content collectively produced via social media remains largely the expression of the values of a relatively small number of contributors with technological ability" (p. 146); however, if we view the production of cartographic content as speaking a language, rather than creating a literal map face, there is a large number of contributors who have the capability of sharing their spatial and cultural knowledge of a given space using common social media features like hashtags and emoji (and symbols alike) to *communicate* cartographic content. Similar to Caquard (2014), Haklay (2013), represents another side of critical cartography by criticizing how, rather than empowering the masses, user access to contemporary cartographic technologies has only "opened up the collection and use of this [geo]information to a larger section of the affluent, educated, and powerful part of society" (p. 66). The scope of this study genuinely aligns with this statement, as mapping technologies like Google Earth and Open Street Map—despite their demonstration of social cartography: being easily accessible and promoted with an element of social interaction—will likely only be sought by socio-groups with the interest and knowledge that this software catalyzes. I argue, however, that in order to study social mapping in a more efficient and generalizable way, there is a need to analyze social mapping and social cartosemiotic conduct on platforms that are accessible to all demographics. These platforms do not need to be highly advanced in GIS or cartographic capabilities; rather,

such platform should allow for literal or allegorical *neogeography*. Turner (2006) expresses that "neogeography is about people using and creating their own maps, on their own terms and by combining elements of an existing toolset...[it] is about sharing location information with friends and visitors, helping shape context, and conveying understanding through knowledge of place" (p. 2). Accordingly, this study strives to fill this gap in understanding the benefits of neogeography from the standpoint of socially constructed and communicated map language, (through use of geotags #[location] combined with representative semiology in the form of emoji) that, I posit, is representational of literal neogeographic maps. After all, cartography communicates a narrative of space and culture that transcends multiple media, and social media platforms and features set the perfect stage and existing toolset for this language.

1.3 Need for Research

Around 2005, when internet mapping was becoming more popular due to advancing technology for geospatial information customization online, "the services were limited to information preloaded by the provider and allowed little customization by end users" (Haklay, Singleton, & Parker, 2012, p. 2015). With the advancement of new technology in social media and cartography, geotagging and semiotic interplay with emoji and bitmoji has become a common social phenomenon that is highly customizable. It allows social media users to have more interaction with mapping concepts, like cartosemiotics, and reveals a new aspect of CMC (computer mediated communication) that might alter what we know about behavior in online spaces and how this affects user perceptions. Table 1.1 below outlines the elements that work together to create SCC in computer-mediated communication. This study adds to the understanding of this social media use that is influenced by mapping features on various online platforms.

Table 1.1
Elements that Distinguish the Nature of SCC

Platforms	Geotags	Symbols	Contexts
Twitter	#[location]	Emoji	Model/communicate spatial knowledge
Instagram	Geotagged coordinates (Add/share location option for posts)	Bitmoji	Re-vitalize forgotten spatial information
Facebook	GeoFilters	Picture	Share users' inner model of the outer world
SMS Messenger		Gif	
SnapChat			

Furthermore, social cartography allows users a more well-rounded view of their surroundings, but this is also potentially problematic, since social mapping could lead to another outlet for confirmation bias of spatial and social information, similar to such in media communication and social science research (Knobloch-Westerwick, Mothes, Johnson, Westerwick, & Donsbach, 2015; Nickerson, 1998). According to Tobler's First Law of Geography, which was written in 1970 and defended again in a 2004 forum, "Everything is related to everything else but near things are more related than distant things" (Tobler, 2004, p. 304). This also promotes that in an era of easy and inexpensive global travel, things—such as travel planning and distant cultures— can be studied easily through cartosemiotics. Therefore, it is possible that, like users seeking information in media, individuals will seek out geotagged information that is close to them physically/spatially, in addition to seeking out spatial information that reflects their own biases and opinions. Cartosemiotics on social media has and continues to nudge individuals to regularly self-disclose location, which is starting to redefine laws and social norms of privacy; for example, almost all mobile devices are required to be

geographically enabled (Sui & Goodchild, 2001), and users commonly prefer to set their location settings on in order to filter their mobile internet searches, GPS navigation, coupons and deals within the range of their exact surroundings according to location-tracking and position-aware location-based services (Barkuus, & Dey, 2003; Unni & Harmon, 2013) his research is needed to highlight these concerns of online communication of space and allude to solutions or suggestions to be considered in user experience/interaction (UX / UI) in practical realms of social media platform re/design.

1.4 Purpose and Research Questions

This study seeks to describe the existence of social cartosemiotic conduct on specific social media platforms, and analyze how this conduct is self-reported by, and hypothetically affecting, social media users. The fundamental theories that inform this study include cartosemiotics, sociocultural theory, self-disclosure, and communication privacy management theory. These theories, with the exception of cartosemiotics, are primarily from a communication research standpoint; however, this study posits that there are congruencies in cartographic communication and social media engagement, which will reflect theoretical overlaps. These theories will help inform the behavioral aspects of social cartosemiotic conduct and how this behavior effects and/or reflects societal communication practices and understanding as a whole. The overarching questions driving the goals of this study include: (1) What is the interactive nature of social cartosemiotic conduct on social media platforms that have adopted mapping technology? (2) Consequentially, does this conduct affect individuals' spatial awareness, social perspective, and/or concern for privacy? Through an extensive literature review analyzing the convergence of media communication and cartography, as well as a proposed multi-quantitative method, this study will strive to answer these questions.

CHAPTER 2. LITERATURE REVIEW

2.1 Hegemonic to Social Media: Cartography and Online Platforms

Before the Geographic Information System (GIS) and Web 2.0, communicating location and place was not as easy and accurate as dropping or sharing an instant 'Pin'[2] on a mobile device. Cartography and geodesy[3] have always been grounded in mathematics and seek to be unbiased; however, with limited technology and circumnavigation in historical contexts, representative symbols on maps were used as placeholders to communicate space and navigate different cultures. Now, this form of geo-communication is more representative in descriptive, informal posts about vacation, travel, or place on a social media feed.

Ancient maps were highly subjective and only fashioned by affluent individuals, commonly men, who used hegemonic cartography to situate the political, geographical, economical, and social boundaries of a place (Pickles, 2000; Carter, 2009; Barreneche, 2012; Haklay, 2013). *Hegemony* is a cultural or economic understanding of surroundings resulting from societal leaders' ability to accentuate their bias perspectives on the masses (Artz & Kamalipour, 2003). *Hegemonic cartography* outlines this principle from historical mapmakers' perspectives, as they were the leaders in designing the world façade. These artistic maps did attempt to implement mathematical practices, such as Cartesian space coordinates, to logically present a worldview; however, these practices were not consistent with an accurate representation of the world, and portrayed more spatial experience in the eyes of the mapmaker,

[2] "A term to describe your location on Google Maps. A feature of Google Maps allows users to locate a place on a map then drop the pin icon on that area. Users can then add a title and description before saving the location in their personal 'My Maps' area" (Beal, 2017).

[3] Geodesy is the "science of the measurement and mapping of the Earth's surface" (Helmert, 1880, p. 2) and Wolfgang and Muller (2012) add that the contemporary definition includes the orientation of Earth in terms of outer space.

rather than a logical spatial representation. This misrepresentation stemmed from a series of misunderstandings of semiotic use that supplemented the Cartesian abstraction; the graphical rendering in spatial symbolization narrowed the scope to audience interpretation for understanding the world (Casti, 2015). Fast-forward to an advanced technological age, and maps are designed according to more accurate coordinates based on spatial algorithms using technical computer software, GIS capabilities, and consistent symbolization.

This contemporary practice might seem more logical in its representation; however, representing space using grids and coordinates, or Cartesian geometrics, has manipulated the representation of accurate cultural experiences in order to prioritize bureaucracy and capitalism (Wilmott, 2017; Sadler, 1999; Carter, 2009; Pickles, 2000, 2004; Dodge & Kitchin, 2013; Monmonier, 1991). In order to maintain a balance between portraying cultural experience and objective physical representations, neogeography was implemented as social mapping to allow for a democratized cartographic process. Some scholars are critical toward the benefit of this practice, but Turner (2006) expresses that neogeography is about people using and creating their own maps, on their own terms and by combining elements of an existing toolset...[it] is about sharing location information with friends and visitors, helping shape context, and conveying understanding through knowledge of place" (p. 2). The evolution from hegemonic to social cartography shows how audiences and media users have progressed to a point where they want to be a part of creating the information that is sought by others, rather than blindly following what is communicated by others.

Similar to the evolution of cartography, media communication was originally in the control of few dominating powers with the affluence and social status to maintain media content (Baran & Davis, 2013; McQuail, 2010; Turkle, 2012). This hegemonic capability was debunked

after social media began to take rise after the integration of Internet and information communication technologies in society; however, some scholars shifted their critical focus to technology as a hegemonic power (Turkle, 2012). Similar to how technology dictated the limitation in which mapmakers could represent our world, technology dictated the boundaries in which people could create and perform within that worldly representation. As digital communication media converge with other discipline technology, these "new media technologies have the potential to re-orient us and, by extension, radically intervene in our understandings of place—specifically the public spaces of the city—and our places in it" (Verhoeff, Cooley, & Zwicker, 2017, p. 299). The cartosemiotic ability that social media technology mediates allows users to convey place in terms of spatial awareness, or relating social context, which can attribute to a more commonly known process deemed 'technological determinism' in which "the point to understand [is] how far technology does or does not condition social transformations" (Gunkel, 2007, p. 19). The growing prominence of semiotic language in online communication (Danesi, 2017) and categorization of place and social components, is due to the influence of emoji and bitmoji symbols promoted in social media technology in addition to the social desirability of hashtag use dictated by technologically-mediated communication, or computer-mediated communication (CMC) theory.

2.1.1 Information Seeking: Cartosemiotics and Media Communication

In the physical realm, geographical proximity is the quantifiable distance between people, societies, and land; this proximity exists in a cartographic sense like cross-country or across the street, which can be understood through map models as they visualize this tangible proximity. This is the spatial information that is commonly sought for purposes of navigation and travel. Recently, however, geographic proximity is also understood in the invisible realm due to

technology that allows people to map and/or access virtual realities; “maps have become interactive to the point that they are co-produced by their users... [and users are] constantly influenc[ing] the shape and look of the map itself” (Lammes, 2017, p. 1020). The integration of technology in spatial information seeking has changed how we determine place and space. Mobile devices provide instant, real-time access to direction suggestions according to nearby traffic, road construction, in order to predict how distant places are from any given location. The way mobile technology presents this spatial information also mediates cultural influences based on location; for example, when a user searches a city on Google Maps’ online platform, the geographical proximity and boundaries of the city is presented, as well as corresponding weather, hotel and restaurant reviews, facts about the community, and pictures of the best areas in that city. Moreover, technology and media platforms have expanded spatial information seeking capabilities to include foreign countries and cultures in order to help shape well-informed perceptions. How people come to understand the world around them includes this spatial information seeking through various platforms; specifically, “how people perceive space and time, and, subsequently, how they refer to these, is the subject of naïve geography, defined as ‘the body of knowledge that people have about the surrounding geographic world’” (Egenhofer & Mark, 1995, p. 4).

This information seeking and analysis used to be more interpretive in pre-GIS mapmaking; for instance, symbols and map-face design were not consistent across assorted maps (Pikles, 1995; Carter, 2009). Cartographers chose symbols and design that they believed coordinated with the culture and location of the land—which of course varied among land. For example, Figure 2.1 portrays the medieval European Islands with pictorials that show colors, animals, and monsters that subjectively portray the cultural tone of each landmass.

Figure 2.1: Map of medieval Scandinavian islands

This interpretive nature of maps was disadvantageous due to subjectivity and cartographer bias (Pickles, 1995; Carter, 2009; Garfield, 2003), which prioritized the depiction of cultural experience and power at the expense of physical, spatial accuracy (Pickles,1995; Garfield, 2003); although, compared to contemporary maps that are consistent in design and convey objective language, the historical maps actually convey spatial information that is more accurate. For example, contemporary maps, such as Google maps or GPS alike on mobile devices, leave absolutely no room for interpretation or spatial information related to differing cultural experience. This limitation to spatial information seeking has been examined by many scholars who study critical cartography. For instance, Wilmott (2016) states that Carter's (2009) assessment of critical cartography becomes complicated when he stresses a need for immediacy of simultaneous movement and representation, and Wilmott (2016) furthers that mobile mapping is the answer, as it "engages a divergent set of movement practices, ones that not only respond to the mobile map, but are also reflected in it, on the cartographical interface on the screen" (p.

325). My study extrapolates on this progression, by arguing map language, or Cartosemiotics, is more potent than mobile mapping in providing simultaneous movement and representation on social media platforms accessible by the public. Geographical or cartographical information is no longer bound by the limitations of a map-like interface; a message that contains elements of cartosemiotics (geotag and a symbol), translates a replica of messaging that emerges from a literal face of a map. This renovates how information seeking is defined in cartography, as map language can be created and accessed on cartographic platforms, as well as social media platforms. In Figure 2.2, we can see how the combination of a geo-hashtag and emoji can express spatial awareness, and meet the cartosemiotic context: Model/communicate spatial knowledge.

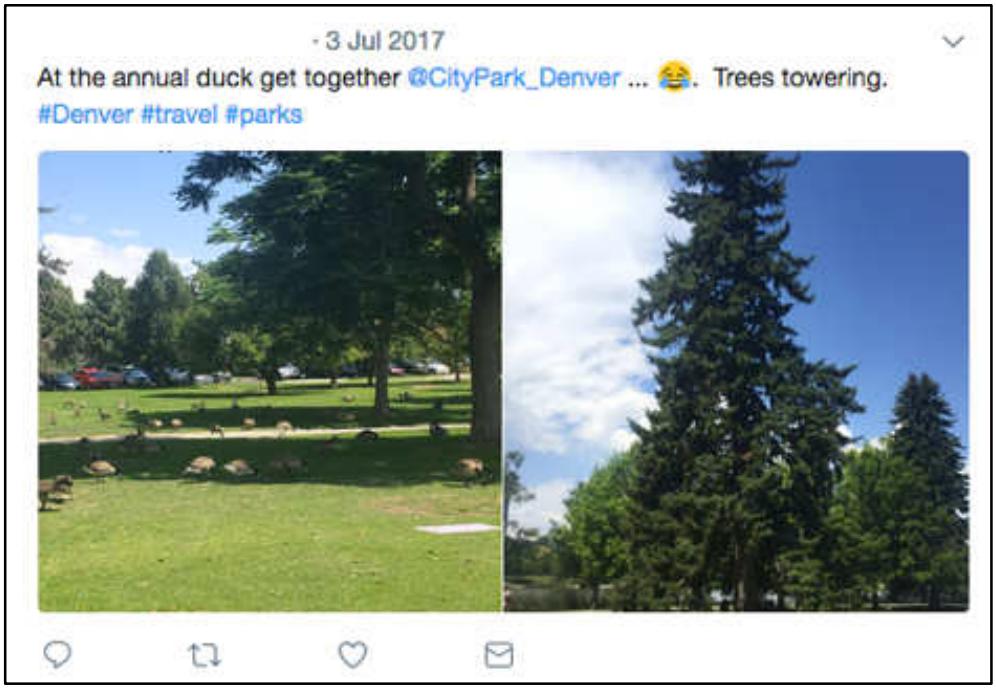

Figure 2.2: Tweet Showing Social Cartosemiotic Conduct

This tweet is conveying the poster's spatial awareness by sharing his/her view of a place in Denver. He has coupled #Denver and an emoji from the lexicon category Smileys & People to combine elements of cartosemiotics and portray a semiotic emotion attached to a geotagged

place. This example of modeling spatial awareness/knowledge on Twitter adds to the social spatial awareness/knowledge of the city of Denver. In addition, as seen in Figure 2.3, the geo-hashtag emoji combination expresses social perspective, as well as the cartosemiotic context: Shares user's inner model of the outer world.

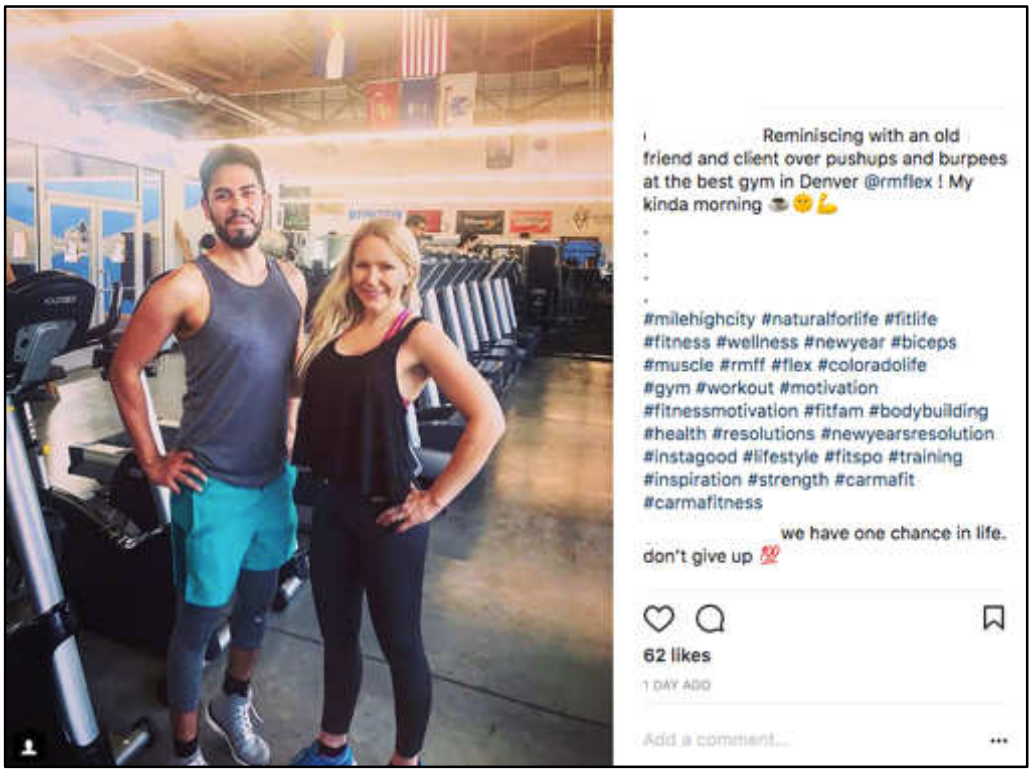

Figure 2.3: Instagram Post Showing Social Cartosemiotic Conduct

This user on Instagram indicates a piece of their life in respect to a greater geographic whole, or Denver, by including geo-hashtag #milehighcity. S/he has also combined emojis from the lexicon categories: Food & Drink, Animals & Nature, and Smileys & People in order to symbolize their inner model of the outer world. This individual example of social cartosemiotic conduct portrays a social perspective of Denver (the Mile-High City), as the user connects the semiotics of his/her healthy, happy lifestyle to the characteristics of this geographic location, adding to the overall social perspective of Denver.

Another specific example of cartosemiotics in social media information seeking is related to diasporic audiences in western culture. Media posts from western lenses evoke "memories of the homeland ... while simultaneously creating anxieties for these viewers by emphasizing their geographic and cultural distance from their homeland…as a result, they were reminded that they were cultural 'Others' in relation to [their] contemporary [homeland]" (Somani & Doshi, 2016, p. 5). This shows how communicating space and place through communication media can lead to strong social perspective influences, and therefore change the accuracy of information sought online.

2.1.2 Visual Rhetoric: Cartosemiotics and Social Media

Both fields have advanced an interest in visualization. Mapmakers and social media users always want more accuracy when communicating or viewing information. Map visualization in the early digital age and earlier had limited colors to use on maps until there was an explosion of color used to portray specific information spatially. Similarly, emoji have evolved from yellow round faces that express general emotion to gender, race, and cultural-specific emoji that portray accurate skin color, hair, offline physical expression, etc. Retrospectively, similar to the misinterpretations that occur from rendered cartographic symbols, the colors and shapes of emoji present their own cultural biases on social media platforms.

Accessing and creating spatial information expressed via map language, or cartosemiotics, is not strictly text-based. Cartographic studies overlap with the physical realm of geographical proximity, as "Cartography describes places and spatially distributed phenomena graphically, using a system of (cartographic) symbols" (Enescu et. al., 2015, p. 224) that can be quantified. Cartosemiotic research incorporates elements of figurative proximity and how symbols and data visualization through maps share close or distant relationships with culture and individual viewer

schema. These symbols, which vary among different platforms from Bitmoji on SnapMap, to Pins in Google Maps, provide distinct context that can be viewed from a persuasive angle. The visual rhetoric entrenched in these symbols exudes a persuasive context and purpose of the spatial information; for example, Bitmoji on SnapChat are personalized to reflect the identity of each user, so this real-time symbol anthropomorphizes the map on SnapChat by providing unique human identity and performativity, rather than consistent symbols and objective lines that provide no variance in spatial-cultural experience (See Figure 2.4).

Figure 2.4: An example of Bitmoji symbols on SnapMap. Reprinted from Why advertisers should pay attention to Snapchat's new maps feature, by A. Heath, 2017, from http://www.businessinsider.com/how-snapchats-snap-maps-feature-could-be-big-for-advertisers-2017-7

In a way, these social media features that allow for cartographic visual rhetoric are creating a feedback loop back to interpretive style maps, while still trying to balance physical, spatial accuracy. Carter (2009) alludes to this visual rhetoric that cartosemiotics possess, insofar to examine how lines on maps dictate a certain rhythm that drives the context of its representation, but it cannot exist in solidarity without the addition of public/cultural experience and interpretation. Specifically, Carter (2009) states:

> The lining, which is simultaneously the rhythmic geography underwriting the map and... motion of the public coming together in public space, is stitched into the garment of representation, but it does not adhere to it completely...This becomes important in discussions about the relationship between representations and the world they seemingly represent. (p. 14)

This literal lining underwriting the map that also converges people in a space can also be viewed as a metaphor relating to specific language that determines cartosemiotics; for example, hashtags such as #[location] are geotags that are the foundation of map language on social media, but do not adhere to spatial representation completely without contextual symbols like emoji. There are neogeographic platforms that allow users to add to the visual rhetoric of a map, but I contend that interfaces that allow users to add to cartosemiotics, rather than—or in addition to— a physical map itself, is just as persuasive and spatially informative. Relatedly, Lammes (2017) intellectually concludes that "cartographical interfaces invite users to a higher or lesser degree to give input that changes the map image and puts users in the map (p. 1029); furthermore, I extrapolate that cartographical interfaces, particularly ones provided by social media features, invite users to give input that changes map *language* and puts users at the forefront of this vernacular.

2.1.3 Semiotic Convergence of Social Media and Cartography

Symbolic features used in social media, like emoji, bitmoji, and images attached to posts mimics the idea of animating data, which involves temporal proximity that "feature[s] animations [that] show change over time or space, enabling audiences to track variations in data through motion—across a map, scatterplot, or other plotting area" (Kostelnick, 2016, p. 123). These affective symbols that create context and meaning in social media communication are relatable to ancient map semiotics used to convey bias cultural boundaries. Therefore, this study posits that there is a semiotic convergence from ancient map symbols to the emoji lexicon. Emoji

and Bitmoji are social symbols used in online communication that promote or supplement emotion in online messaging and sharing, as well as convey affect (Riordan, 2017; Desani, 2017). “The use and type of emojis has increased in recent years; particularly emojis that are not faces, but rather objects” (Riordan, 2017, p. 549), that do not portray emotion, but are commonly used to maintain and enhance social relationships or provide context to a shared message (Riordan, 2017).

The semiotics component of cartosemiotics in social media is highly important, as map language cannot exist solely on a geotagged post. How we model our opinions and thoughts online are derived from a symbol system interplay across disciplines. Csanvi (1998) outlines this phenomenon clearly, which can be understood in a cartographic and social media perspective:

> Our models of the living system can use abstract components, even semiotic interactions, but they are products of the human mind with which we try to simulate reality. Meaning exists only in our own mind. Society can also be modeled in a semiotic way, but we know from our everyday experience that the organization of society is based on a great many unreliable components, and the self-organization of society uses only some of these properties. (p. 260)

When coordinated with a geotag, or specified location, a symbol can contextualize a place. Humphreys and Liao (2011), analyze geotagging, specifically via mobile technology, as a social practice, and examine geotags (on the platform Socialight) as “adding ‘virtual information’ to a physical location by leaving virtual sticky notes around a city” (p. 408). This relates to the practice of including #[location] on social media posts that virtually specify physical places in cities and beyond. As of today, #nyc (New York City) and #london are both rated in the top 100 most hashtagged words on social media, which means people are taking this geotagging ability from earlier platforms like WikiMapia and OpenStreetMap, and replicating that experience in social media posts. Barreneche (2012) promotes that “this increasing and seamless integration of geocoding into our everyday communications may make location a default protocol setting of

communication, and soon a taken-for-granted dimension of our media experience, to the point of rendering the prefix 'geo' in geomedia superfluous" (p. 332). Comprehending the social media use of #[location] can be difficult, since—like the use of emojis—hashtags can carry underlying meanings or tones subjective to the sharer because hashtags "perform an implicit emotive or emphatic function in addition to [their] topic tagging function" (Wikström, 2014, p. 134). For example, it can be difficult distinguishing between a hashtag as a literal location and a hashtag portraying themes of sarcasm, since "these tags make attitudinal additions" (Wikström, 2014, p. 140) to social media posts. Teasing the differences in tones with the use of #[location] and emoji could prove extremely interesting results to explain social media users' motivations for social cartosemiotics; however, this study's analysis is merely looking at the literal presence of combining geo-hashtags and emojis in social media, or how recipients/viewers of these posts would read them at face-value. Once the presence of social cartosemiotic conduct is defined in this study, future studies will be planned to further distinguish social cartosemiotics from the posters' perspective; for example, if their use of emoji and #[location] is meant to be sarcastic, humorous, informative, propagandist, etc.

2.2 Critical Cartography and Media Communication

Critical cartography and GIS studies will propel this research because this cartographic system, although technical, uses different algorithms that are used in strategic ways to accomplish a specific view of land, space, or shopping malls showing how map language is not just informative, but influential and culturally persuasive; for example, Pickles (1995) examines this manipulation and interpretation of data and explains how mapmakers/GIS programmers have hegemonic power. This lens will be used to analyze how this power is relevant when social

media users engage with social cartosemiotics wherein there are multiple users interacting with and creating on a map, rather than few programmers creating the spatial information.

Carter (2009) writes that cartographers and GIS programmers are "agents of symbolic transformation, [who] have signed up to the cult of smoothness, from which every wrinkle of time has been airbrushed" (Carter, 2009, p. 2). Critically, his research posits how there is a need for honesty in cartographic representations to truly create documents— "and the future history they inaugurate, of colonization, territorialization, and authorization of new political and social order" (Carter, 2009, p.3)— that communicate an accurate narrative of space and time.
Other critical scholars share the same passion as Carter, promoting how, for example, "cartographic information is derived not from the world in some pure and unmediated form, but is constrained by the parameters of capture technologies and altered through the lens of what is deemed important by cartographers and their paymasters" (Dodge & Kitchin, 2013, p. 31). Although it is assumed that hegemonic mapmaker bias concluded with the rise of technology, the reality is the technical and objective façade that technology exudes is merely masking this hegemonic cartography in our modern era. For example, when Carter (2009) characterizes map design language through discussing the history of a line, and how the rhythm of using lines, and its reconceptualization, is what influences this map design language; he further discusses how "Modernists spiritualized or dematerialized the line in an attempt to represent essential forces, but the movement attributed to their lines remained linear...There was little sense that the line had a history, or, as we might say, lining, that it was formalization of a field of traces rather than the outline of a past, present, or future object" (Carter, 2009, p. 14). Mapmakers attempted to convince a more meaningful interpretation behind the use of lines on contemporary maps;

however, although this seems naïve, lines are inherently linear, and cultural experiences contextualized in spatial information do not exist in straight-line patterns.

Since critics posit that contemporary map images lack the necessary portrayal of cultural experience in space and time, an important question accumulates in Wilmott's (2016) research:

> Can we live with maps differently? —With the phenomenon of geo-locative and Global Positioning System (GPS)-enabled technologies, can we find ways in which to express a cartography that engages movement and expresses motile experiences meaningfully, without being reduced to repetitive and generic representation? (p. 321)

Wilmott (2016) concluded in his study that "in-between mobile maps and media, an invisible breadth of perception sits...and shows that indeed, maybe, we can live with our (mobile) maps differently" (p. 333).

My study attempts to fill this gap of invisible perception through promoting the dominance cartosemiotics in social media and online communication. Critical cartography examines maps in abstract ways; however, the majority of this research stems from the image of the map itself and what and how the image communicates; if the map *language* is explored as a representation of visual rhetoric from map image, we can see how individuals can live with cartography differently by engaging with different elements of cartosemiotics (geotags, #[location], emoji, bitmoji, etc.) to express and understand unique spatial experience.

2.2.1 Spatial Awareness

This study frames spatial awareness in the scope of Bolton and Bass's (2007) study, who define the term according to three levels of awareness:

> Spatial awareness (SpA) is an aspect of situation awareness (SA) that encompasses the extent to which a person notices objects in the environment (Level 1), his understanding of where these objects are (Level 2), and his understanding of where they will be in the future (Level 3). (p. 2582)

This variable of critical cartography and critical social-cultural communication is a key element to this study as it pertains to spatial information seeking and expression through cartosemiotics on social media, as well as how one situates oneself in according to objects and understanding of one's surroundings. Edward T. Hall (1990) examines this phenomenon in a more theoretical lens, explaining how, why, and to what degree individuals situate themselves in a given space physically or cognitively. Social media platforms allow users to cognitively situate themselves in a space, and now with the prominence of location-based sharing and social cartosemiotic conduct (SCC), users can in a sense share online how they physically situate themselves offline. This might impress the opinion that SCC allows users to further establish a sense of place; however, scholars like Lammes (2017) reference other critical cartographers and media scholars who emphasize that, "in relation to space, scholars even argue that new media deprive us of a sense of place. Through their global and ubiquitous use and through representations, they are said to create 'geographies of nowhere'" (p. 1022). In order to map this spatial awareness or geography of nowhere, "people use mobile geotagging to coordinate social movement" (Humphreys & Liao, 2011, p. 418) and contextualize this placement with semiotic meaning. This study will further the critical discussion on how SCC and other forms of cross-disciplinary CMC helps or hinders user spatial awareness.

2.2.2 Social Perspective

As stated by Wilson and Boyer et. al. (2008), "Proximity is not only based on the number of kilometers separating them, but also on the individual's perception of this physical distance;" (p. 981) it involves relational or social proximity and "it involves much more than 'being there' in terms of physical proximity" (p. 982). Furthermore, social media posts that portray social cartosemiotic conduct is related to Stefanidis et al.'s (2013) study on community building in

social media merged with cartographic considerations, in which they determine "a new perspective to geopolitical boundaries, showing how the world is structured and connected despite its political boundaries rather than because of them" (p. 126). Overall, social cartosemiotics is a vehicle for establishing individual and communal social perspective online, which reflects "one of the goals behind location-based services creat[ing] more contextualized communication" (Humphreys & Liao, 2011, p. 420).

In order to focus the complex construct 'social perspective' to a measurable resulting variable of SCC, this study adapts a modernized version of Hett's (1993) definition and scale of Global Mindedness, derivative of Sampson and Smith's (1957) worldmindedness, to reflect social perspective; Hett's (1993) definition of Global Mindedness is as follows: "A worldview in which one sees oneself as connected to the world community and feels a sense of responsibility for its members. This commitment is reflected in attitudes, beliefs, and behaviors" (p. 143). Morais and Ogden's (2010) modernized Global Mindedness to Global Citizenship, which takes into account three different dimensions constituting its definition in their study: social responsibility, global competence, and global civic engagement. Social perspective, as a result of CSS, encompasses the same understanding of the global competence dimension of Global Citizenship, which will be further operationalized in the methods section of this proposal.

2.2.3 Concern for Privacy

As technological advancements continue to create new opportunities and platforms for individuals to share and seek information, privacy has become a key factor in almost every dimension of public communication research and industry. Major tech businesses, like Google, Microsoft, and Apple, have teams of employees who strictly focus on addressing privacy concerns in user experience research. For legal reasons, their products all users to "create

deterministic rules specifying which part of the content will be shared, and to whom the content will be accessible" (Liang, Shen, & Fu, 2017, p. 1477). However, Liang et. al. (2017) emphasize that "privacy is a culturally specific phenomenon," (p. 1476) and the permeation of technology in daily lives propels cultural change. Furthermore, individuals are spending more time building relationships and seeking information in online realms in order to build what now seems to supersede privacy: social capital. For example, "Concerning individual-level factors, the number of followers and the number of followings exhibited different effects on privacy protection [; for example,] having more followers indicates higher probability of geo-disclosure" (Liang, et al., 2017, p. 1489) because "users are motivated to self-disclose for building social capital" (Choi & Bazarova, 2015).

Due to the synergy of cartosemiotics and social media engagement, over half of the information shared in online platforms is location-based. One of the questions that this study alludes to is the self-reported concern for privacy to see if individuals are less concerned due to social capital gain, or if they are truly unaware of how invaded their mobile/online information is. Wilmott (2016) reminds that any content from mobile devices is always, subtly or confidently, geotagged with location and time data. Specifically, tech companies acquire this data to drive their market and user research, or sell this geotagged data to other marketing companies for profit, "implicitly spati[al]temporalizing media according to the cartographic logic of the map" (Wilmott, 2016, p. 321).

2.2.3.1 Self-Disclosure. Privacy settings and cautions that act as nudges on mobile devices should influence users to share information with a sense of awareness and restraint; however, studies show that users use this 'control' of their privacy as a scapegoat to disclose more personable information (Liang, Shen, & Fu, 2017; Stutzman, Capra, & Thompson, 2011).

As privacy becomes less of a concern in light of building social capital, self-disclosure becomes more prominent in online platforms and has actually become a social media norm. In order to acquire more followers and likes on a post, self-disclosure is key because users become more relatable when they disclose more information—and the one piece of information that all unique individuals can always relate to in some way is place or location. For instance, even though Twitter gives its user an option to disclose their tweets to the public, or to customized viewers, "Twitter users are more likely to include location information when tweeting about offline activities" (Liang, et al., 2017, p. 1481). In order to engage in social cartosemiotic conduct, individuals must be at least somewhat comfortable self-disclosing the location and context/opinion of a given place; therefore, this type of online communication research will inform new elements of self-disclosure, and will add to the understanding of privacy and self-disclosure in cartographic user experience.

2.2.3.2 Communication Privacy Management Theory (CAPM). CAPM theory posits that "privacy boundary draws the line between private information and public information [, and] individuals create and apply rules to manage if and how information will be shared or concealed" (Liang, et al., 2017). This theory informs this social cartosemiotic conduct study, as the user communicates information online within their determined privacy boundaries. For example, a user might share a post consisting of #starbucks #fortcollins with a coffee emoji and smiley emoji, but she will choose to manage the time in which she shares that self-disclosed information. If a user shares this before or while she is sitting in the Fort Collin's Starbucks, she is less likely to be concerned with the privacy of her location to the public; the analysis would be different if the individual shared this after leaving the shared location, as this would

hypothetically indicate user concealment of current location representing their real-time privacy cognizance.

2.2.3.3 Concern for Information Privacy Theory (CFIP). CIFP is more of a construct than a theory, however, it was developed as an instrument (15-item scale measuring concern for information privacy) by Smith et. al. (1996) which has been used to measure the concern for privacy employees had in the workplace considering advancing technology and Internet (Stewart & Segars, 2002). Smith et. al. (1996) evaluated information privacy from three dimensions including information collection, information management, and secondary use. Although these dimensions were used to reflect strategic communication and company privacy for employees, the same characteristics can be applied to 'computer' or 'online platforms', rather than their constant variable 'company'. The way social media users share, collect, manage, and use their self-disclosed information defines the properties of online communication, and, specifically, social cartosemiotic conduct. Gordon's (2007) research adds an important consideration of commodification to CAPM and CIFP; he establishes:

> While the ability to locate oneself and one's data within global networks is potentially empowering, it also transforms the everyday into a product. The cost of locating oneself within digital networks is being located within those name networks—not as a person, but as a commodity, as data. (p. 898)

His statement addresses that lack of privacy management and concern results in simulated empowerment; in addition, users might gain a feeling of social capital, but the reality is that their shared data is more of a monetary gain for media, marketing, and tech companies.

2.2.4 Sociocultural Theory

The fact that individuals are hypothetically more likely to live with maps differently through social cartosemiotic conduct, rather than creating and manipulating a map image, emphasizes a social-cultural inheritance in which "they are fascinated by processes rather than

structures. They do not want to know the world and to reflect on it; they want to invent it, manipulate it" (Carter, 2009, p. xiii). Sociocultural theory in communication stresses that the way humans search, understand, and use information is mediated (Lantolf, 2000); this mediation allows humans to interact with and add to the world by using "symbolic tools, or signs, to mediate and regulate relationships with others and with [them]selves" (Lantolf, 2000, p. 1) This semiotic engagement can be specified in cartosemiotic elements that individuals can implement in social media spaces to communicate their understanding of the world (or place) and where they exist in that space. Furthermore, referencing cartosemiotics in this case is highly relevant to sociocultural theory, as Lantolf (2000) stresses that "among symbolic tools are numbers and arithmetic systems, ... and above all language... [which is used] to establish an indirect, or mediated, relationship between [individuals] and the world" (p. 1). This theoretical lens exemplifies how cartosemiotics, or map language, should be used in conjunction with the technical symbols and algorithms of contemporary mapping images in order to better understand and represent perceptions of the world culturally and spatially.

This mediation of symbols and cartographic language correlates with our computer mediated communication via "mobile technologies that have contributed to new social and cultural practices: practices that produce and sustain communities, practices that have a fundamental impact on our ways of representing the world around us and understanding our place within it" (Verhoeff, Cooley, & Zwicker, 2017, p. 299). Social cartosemiotic conduct that exists on social media platforms is an ideal example of how individual communication on space and time is mediated by symbols and technological features to express unique representations of the world, and view other representations to impact their own understanding of place. In contrast, easy access to online mapping and map language, without dictated perception, would seem to

yield democratic views of the world and foreign cultures; however, studies show that this media—maps as cultural products—actually reinforce a limited Westernized view of the world (Wall & Kirdnark, 2011; Somani & Doshi, 2016). This is because people who share geotags on social media or portray social cartosemiotic conduct as a representation of foreign place, cultures, or experience, are usually entrenched with a westernized ideology (Wall & Kirdnark, 2011) that centers online social communication.

From a marketing communication standpoint, analyzing spatial information in terms of consumer location will dictate how brands are built and disseminated. Moreover, socio-spatial organization is commonly used in marketing strategies and technologies that combine identity (behavior and culture) and residential location; this system is "built upon the sociological assumption that location, particularly where we live, signals social and cultural characteristics of a given population" (Barreneche, 2012, p. 337). Cartosemiotics, particularly on social media profiles, can therefore propel marketing research, since users willingly share their corresponding geotags (#[location]) and contextualize this place with symbols (emojis or pictures). This language allows market researchers to 'map' where and how specific consumers identify with their products or competing brands.

Beyond consumerism and technology, "the act of mapping becomes the means through which the unique systems of family, work and leisure are organized into a manageable whole [, or a] spatial organization of everyday life" (Gordon, 2007, p. 898). This is highly relatable to how individuals communicate and organize spatial information on their social media profiles, as Facebook, Instagram, and Twitter have become digital outlets for scrapbooking space and time (Goodsell & Seiter, 2011) through personal pictures, categorical hashtags, and contextual or affective emoji.

2.2.5 Participatory Mapping Convergence with Social Media Engagement

Similar to neogeography, participatory mapping, or Volunteered Geographic Information (VGI) reflects how individuals and their experiences should be the center of cartosemiotics and map design. This mapping process strives to put aside Western ideologies, or hegemonic filters, by not assuming the structure or representation of a foreign culture and land; rather, these social and geographic perceptions are collected first-hand from residents of unknown lands and incorporated into cartographic representations. "The apparent willingness of many people to participate for 'free' in crowdsourcing projects is undoubtedly based on the fact that they provide genuinely effective platforms to connect socially, communicate meaningfully, and contribute collectively" (Dodge & Kitchin, 2013, p. 20). The oldest and still relevant form of participatory mapping is indigenous cartography. This cartography represents an example of hybridizing geospatial representation and honest cultural representations, which are otherwise often over-westernized (Laituri, 2011). Furthermore, this participatory mapping reflects "spatial representations that recognize and respect the uniqueness and importance of indigenous spatial expressions" (Caquard, 2014, p. 143).

Open Street Map is the most prominently used example of participatory mapping that shows the collaborative nature of VGI. This platform "enable[s] a shift in the empirical focus of cartographic research from the rules and science of map-making and what maps represent and mean, to how maps are constructed in practice and do work in the world to solve different tasks" (Dodge & Kitchin, 2013, p. 25). For example, "in geocrowd mapping projects such as OpenStreetMap, people voluntarily collect, clean, and upload GPS tracks and add attribute data in order to produce surveyed geospatial information" (Dodge & Kitchin, 2013, p. 20). In order to examine participatory mapping practices in social media messaging, Open Street Map

performativity is a great lens to analyze a standard for social cartosemiotic conduct. Like people performing in Open Street Map, users collect, share, and add comments to cartosemiotic data on social media platforms to produce a similar result of surveyed spatial information.

The idea of participatory mapping is reflected in the performativity of social media users' social cartosemiotic conduct. Users voluntarily add cartographic language, such as #[location] and contextualizing emojis, to their social media posts to express their understanding of their place in the world. This specific communication act should not be underrepresented in online CMC, as it could allow scholars from cartography and communication to reinforce or declare new assumptions of spatial information. One of the goals of this study in defining social cartosemiotic coduct, is to define how #[location] is shared on social media, since hashtags are very coarse and are not always specific to the literal category shared. For example, social media users might share #FortCollins to reference the location, but they also might use this categorical stamp to show they are part of a group, advertise a business in proximity, or to recall memories associated with this location. These more unique contexts (among others) that accumulate as the coarse definition of #FortCollins were combined and generalized to the social cartosemiotic conduct contexts defined by scholars Wolodschenko (2003), Schlichamann (2003), and Kepes (1967). An example of this generalization would be if a user advertises/promotes a business, park, service, community event, etc., then that user's conduct would fall into the context of Model/communicate spatial knowledge associated with their specific geo-hashtag.

2.3 Theoretical Model

The following model in Figure 2.5 outlines the process and elements of social cartosemiotic conduct (SCC) as it exists on social media platforms. Within a given context, as adapted from elements of SCC definitions by Wolodschenko (2003), Schlichamann (2003), and

Kepes (1967), a social media user will—hypothetically— share a geotag to indicate location and pair that with a symbol that visually supports an affect or the context of the SCC. This process hypothetically relates to individuals' spatial awareness, social perspective, and concern for privacy. This study can be viewed through a lens of social cartography and cartosemiotics, as well as Edward T Hall's (1990) idea of 'proxemics,' or the degree to which individuals arrange themselves physically and cognitively in their space.

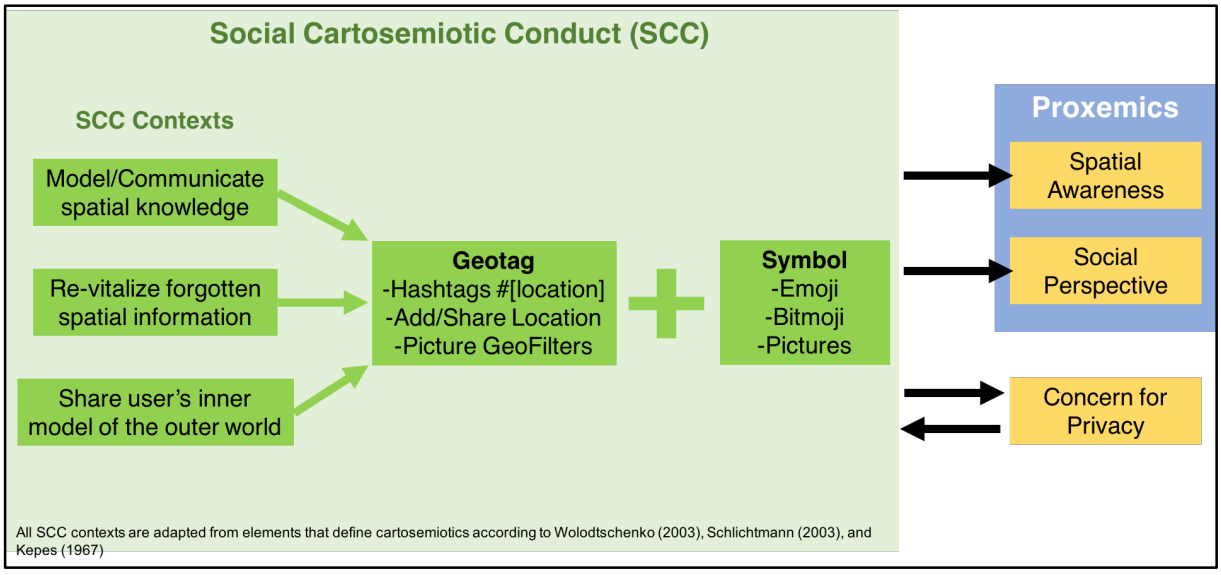

Figure 2.5: A model of Social Cartosemiotic Conduct

2.4 Research Questions and Hypotheses

The overarching questions driving the goals of this study include: (1) What is the interactive nature of social cartosemiotic conduct on social media platforms that have adopted mapping technology? (2) Secondly, how does this conduct relate to individuals' spatial awareness, social perspective, and/or concern for privacy? Specifically, the narrowed research questions to be answered in this study are as follows:

- RQ1: In what context(s) do social media users share posts that include both a geotag

(i.e. #fortcollins, #boulder, #denver) and an emoji? Some contexts that define cartosemiotics, according to Wolodtschenko (2003), Schlichtmann (2003), and Kepes (1967), will be considered; for example:

a) Model/communicate spatial knowledge

b) Re-vitalize forgotten spatial information

c) Share user's inner model of the outer world

- RQ2: Does the context of SCC in a social media posts relate to the choice of emoji category/symbol processes? For example,
    a) Are users more prone to posting an emoji from the Animals and Nature category, if they are re-vitalizing forgotten spatial knowledge through SCC?
- RQ3: How does SCC on social media platforms relate to user concern for privacy? For example:
    a) Do users share their location before, during, or after they have been to the location that they geotag?
- RQ4: How does SCC on social media platforms relate to user spatial awareness?
- RQ5: How does SCC on social media platforms relate to user social perspective?
- RQ6: Are there commonalities between the descriptive data of SCC and how users self-report this conduct?

To examine these research questions, I will conduct a descriptive study via content analysis of Twitter and Instagram posts to test frequencies of SCC features, as well as an analytical study via online survey. Using manifest coding to support a narrative analysis and frequency testing, I will define the un-hypothesized existence of SCC to address research questions 1, 2, and 6. In

addition, I will use correlations from online survey data to test the following hypotheses corresponding to research questions 3, 4, 5, and 6:

- H1: If individuals self-report a high engagement of SCC, then their concern for privacy will be lower.
- H2: If individuals self-report a high engagement of SCC, then their spatial awareness will be higher.
- H3: If Individuals self-report a higher engagement of SCC, then their social perspective will be lower.

CHAPTER 3: METHODS

The objectives of this study were to describe patterns of social cartosemiotic conduct (SCC) on social media platforms, as well as test correlations between individuals' self-reported SCC and their spatial awareness, social perspective, and concern for privacy. Two methods were used to approach both objectives through a quantitative lens. First, a descriptive study via manifest content analysis with deductive coding was implemented using Twitter and Instagram posts that include elements of SCC as a data source. Second, an analytical study via online survey was conducted from social media users who share/hashtag their location with the addition of sharing emoji(s) online, in order to collect self-reported data on SCC and how this conduct relates to a scale of participant spatial awareness, social perspective, and concern for privacy.

3.1 Theoretical Framework: Two Quantitative Methods

Since SCC research in social media has limited research, from what I have gathered, there is a relevance to conducting both an analytical survey and a descriptive content analysis. This allowed me to collect sufficient data to describe the SCC phenomenon, and analyze its presence in breadth and depth. Choosing both survey method and content analysis was not an uninformed decision for this study. In general, "content analysis as a stand-alone research method is consistent with the goals and standards of survey research" (Neuendorf, 2017, p. 38) therefore they are most complimentary as a multi-quantitative method approach. The aspects in which these methods differ in procedure actually support the combination of the two, as the disadvantages of one is resolved by the other. For instance, "content analysis cannot be used to infer cause-effect relationships" (Allen, 2017, p. 245), but survey data will be used to add correlational data and address hypotheses in this study. In addition, online survey data is

collected to the extent in which a participant can recall in an environment that cannot be fully controlled, which might have an effect on the precision of and willingness to answer; content analysis balances this limitation by collecting "data straight from the source, [which] relieves several methodological issues... [and] data is readily available" (Allen, 2017, p. 240).

It is common for researchers to analyze data from a content analysis in order to gather a description to inform a topic or theoretical framework to be used in a survey (Morse & Niehaus, 2009). Specifically, "Content analysis may link their research to other methods and to other data, such as comparisons between content data and survey results" (Riffe, Lacy, & Fico, 2014, p. 42). Even though my study incorporates two quantitative methods, the combination of the two allows for triangulation[4] that advances the validity of the study. Riffe, Lacy, and Fico (2014) agree that "our ability to study important phenomena increases with the triangulation of several data collection methods, and our confidence in findings increases with a convergence of findings from data collection using different methods" (p. 42).

3.1.1 M→R Logic

A study design that has multiple quantitative methods, such as survey and content analysis, is not considered a mixed method (qualitative and quantitative method) design; however, this is appropriate to use when additional data is needed, or if there are gaps left using only one method (Morse & Niehaus, 2009). For example, Earp, Anton, Aiman-Smith, & Stufflebeam (2005) conducted a similar study in which their content analysis explored the messages and claims made by healthcare organizations, and their survey examined the values users had for information privacy, which filled the gap questioning the messages' relation to the users' concerns; their methods related with one another in how the messages/claims provided

[4] Triangulation, defined by Balnaves and Caputi (2001), is "combining different methods to study the same phenomenon" (p. 95)

what the users wanted to know. My study used a similar framework in exploring, through content analysis, the contexts in which social media messages show characteristics of SCC, complimented with a survey that examined the self-reported degree of user SCC engagement in similar contexts and their understanding of spatial awareness, concern for privacy, and social perspective. However, my theoretical framework also needed direction from research on multi-methods that have different samples and therefore do not have correlating results; Neundorf (2017) ensured my study's need for two such methods.

Neuendorf (2017) stresses the importance for multi-methods in communication research, specifically the combination of survey and content analysis; however, in addition to the triangulation of methods, her reasoning is supported by the need for analyzing connections between Source, Message, and Receiver (S→M→R) in communication research. According to Neuendorf's (2017) examples, multi-quantitative methods are most appropriate to observe and relate these media to answer research questions. My study reflected linking message and receiver findings, or the M→R Logical Link as visualized in Figure 3.1. The descriptive findings

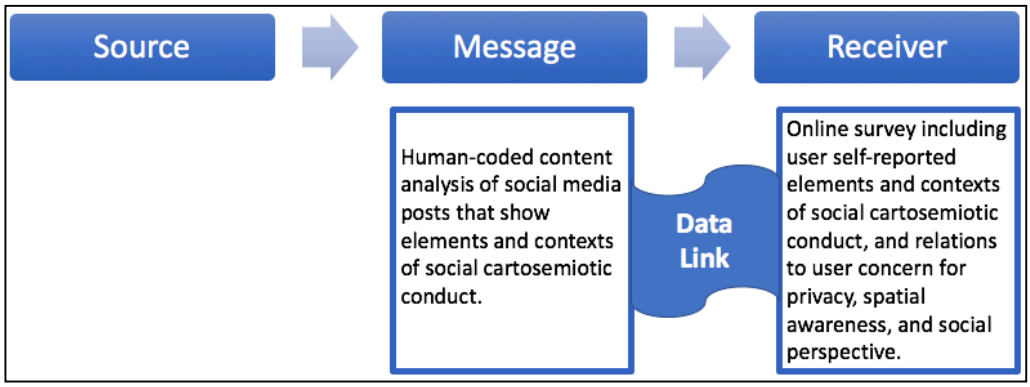

Figure 3.1: M→R Data link example. Adapted from Neundorf (2017)

from content analysis data and the results from the survey data, "each conducted in their own right, are linked only loosely by a logical M→R connection" (Neuendorf, 2017, p. 63); therefore, this model fits the limitations of my study in how the methods' results logically relate, but not

statistically correlate, with one another. Relating the data was sufficient for analyzing links between SCC and self-reports from receivers and/or message sharers, since "researchers are encouraged to add source or receiver data collection to their content analysis studies whenever possible" (Neuendorf, 2017, p. 67). Furthermore, M→R is encouraged because a content analysis can confirm the breadth of the communication/message pattern (SCC) in question, as well as how the degree to which it is widespread across platforms can relate to (or not relate to) the collected self-reports of the specific message patterns and characteristics (Neuendorf, 2017); for example, in an evaluation of an M→R study, "scores on the many content-analytic variables were used as weightings for the [survey] respondents'... exposure measures" (Neuendorf, 2017, p. 62). Considering the use of triangulation within the framework of M→R logic, there are new opportunities for analyzing social media engagement; specifically, this framework helps fill the gaps in this communication research that advancements in technology and CMC have created.

3.1.2 Methodological Gap in Social Media Engagement

Content analysis and survey-based studies have described and analyzed social media engagement through specific hashtags (Bailo & Vromen, 2017; Blackstone, Cowart & Saunders, 2017), in which the hashtags represent codes related to the scholars' research questions. There have also been studies on emoji lexicon and how this visual addition to online communication is affecting individual communication abilities (Turkle, 2012). From my understanding, there are few to no studies, however, that research online communication consisting of pairing of both an emoji and a specific location hashtag, which reflects map language. Studying this pairing invigorated cartographic statements from a social media perspective, and promoted an understanding of social media engagement from a cartographic standpoint. The examination of both location hashtags and emoji via survey self-reported users' map language on social media,

and correlated this performativity to variables such as privacy considerations. This synergy of cartosemiotics and social media engagement indicated how geo-driven individuals are when communicating in social spaces, and how this reflects their privacy concerns. Understanding this priority in SCC through different social media platforms, and applying this to M→R framework, will allow new ways to research target marketing, political re-configuration (locating demographic opinions), and collecting statistics of a location (state, city, district, etc.) according to publically-reported demographics relating to health, crime rate, transportation, etc. For example, a social media user who partakes in SCC could share a message such as:

> *Love being able to pick among many vegetarian options in this city [tomato emoji] [sunshine emoji] #fortcollins #healthyeating*

The #[location] geotag and emoji in that example post indicates that the city of Fort Collins might include a content vegetarian demographic, which could support this location's reputation as a healthy city. This could also reveal a person's "front-stage identity," which Goffman (1959) explains as identity formed from the structure of relationships within a specific environment. The emoji and hashtags could support these front-stage identities because this language conveys how they live in a place supportive of their identity.

Studying the use of #[location] in social media posts did not solely suffice in describing and analyzing SCC, as map language also consists of embedded sign systems or semiotics; therefore, symbols allowed by social media platforms (emoji, bitmoji, and/or images) were observed and analyzed in coordination with geotags. As guided by the provided scholarship, the SCC combination of emoji and #[location] sharing was described using content analysis data, and analyzed using survey data from self-reported user SCC; these two methods are outlined throughout the rest of this chapter. The content analysis allowed for un-mediated observation of

user behavior in SCC; however, the survey data, in particular, showed self-reported SCC that adds value to the data from the content analysis. The self-reported data filled gaps in the context of content analysis examination of hashtags and emoji.

3.2 Content Analysis

The methodology of this study views content analysis as "a systematic, quantitative approach to analyzing the content or meaning of communicative messages. Content analysis is a descriptive approach to communicate research, and as such is used to describe communicative phenomenon," (Allen, 2017, p. 242) or "discover psychological characteristics about individuals or groups who created the messages" (Riffe, Lacy, & Fico, 2014, p. 274). In order to describe the proposed social media engagement of SCC, a quantitative content analysis of social media posts from Twitter and Instagram was conducted to observe the contexts in which social media users share posts that include both a #[location] and an emoji (RQ1). According to the cartosemiotic definitions outlined by Wolodtschenko (2003), Schlichtmann (2003), and Kepes (1967), the proposed contexts in this study include when users model/communicate spatial knowledge, re-vitalize forgotten spatial info, or share their inner model of the outer world. In addition to the framework earlier outlined, this method is used to supplement survey method, as "content analysis uses recorded data, and therefore avoids the issue of misremembering" (Allen, 2017, p. 240) the context in which a user shares a message. Furthermore, this descriptive analysis acted as a "starting point for understanding the effects of particular messages" (Allen, 2017, p. 243), which were then extrapolated to analytical methodologies like survey method to test correlations of these established effects. With a valid coding scheme for multiple coder use, this content analysis set the groundwork for defining social cartosemiotic conduct on social media, in order to then give weight to responses tested in the analytic survey (Neuendorf, 2017).

Specifically, this content analysis followed the three key criteria as outlined by Allen (2017), which states that this method should be objective, systematic and have generality. In order to do so, steps—to be outlined further—were taken to (1) ensure intercoder reliability to decrease researcher bias or subjectivity; (2) present a valid coding scheme, a definite process that multiple coders will follow when coding, as well as proper sampling techniques; and (3) results that have theoretical relevance (Allen, 2017). Furthermore, this analysis collected and tested frequencies of different SCC engagement according to the defined cartosemiotic elements and contexts, rather than the meaning or interpretation of such engagement; therefore, this analysis examined manifest content, which is "the specific characteristics of the message itself, or what the communication literally says" (Allen, 2017, p. 243), or what information is 'on the surface' (Lombard, Snyder-Duch, & Bracken, 2010), rather than latent content that would need interpretive deciphering to code and analyze.

3.2.1 Population and Units of Analysis

Since "content analysis is a grounded theory approach for making valid inferences based on text-based data" (Earp, Anton, Aiman-Smith, & Stufflebeam, 2005, p. 229) and this study described the social media engagement of SCC, the population of this method was all textual social media posts that include #[location] and emoji(s).

The variables, or units of analysis, being described in this content analysis were the #[location] that portrays the geotagged location, the emoji category that portrays the sign system or semiotic element to the SCC (Danesi, 2017) and the context that the post or tweet as a whole resembles. Analyzing these variables supports my first research question, in what context(s) do social media users share posts that include both a geotag and an emoji? And my second research question, does the context of SCC in a social media post relate to the choice of emoji category?

This analysis helped determine the "frequency of specific ideas, concepts, terms, and other message characteristics and make comparisons in order to describe or explain communicative behavior" (Allen, 2017, p. 242) of SCC. Describing the frequencies of these variables, and the patterns in which they were shared together and/or separately, yielded results that define how social media users implement SCC in different contexts and on different platforms (RQ1 and RQ3).

3.2.1.1 #[Location]. Searching geotags in the form of hashtags (i.e. #[location]) was the most efficient way to gather data pertaining to my research questions on SCC essentials like location-based sharing. Previous studies have also collected social media content via hashtag searches in advanced search tools because "hashtags serve as identifying markers that Twitter [and Instagram] users employ to 'stamp' their tweets [and Instagram captions] to categorize posts and make them more easily searchable by topic" (Blackstone, Cowart & Saunders, 2017, p. 604). My study views location hashtags as a specific categorical stamp: a geographical hashtag, or geotag. Furthermore, Blackstone et. al. (2017) studied Tweets relating to the news framing of the Ferguson case through multiple types of hashtags to be mutually exclusive and exhaustive; for example, he would search tweets via "a selection of four hashtags—#ferguson, #michaelbrown, #mikebrown, and #darrenwilson" (Blackstone et. al., 2017, p. 604). My study mimicked this strategy by expanding on searches #fortcollins, #denver, and #boulder, to also include #foco and #milehighcity, which are Colorado geo-jargon to indicate the city of Fort Collins (foco) and the city of Denver (the mile-high city). Therefore, coders accounted for the specific hashtag in each post collected in the sample: #fortcollins, #foco, #denver, #milehighcity #coloradosprings, #colosprings, #boulder. Northern Colorado was used as the population for this content analysis, since my survey convenience sample reflected this population. Even though the

content analysis data from social media cannot be considered representative of the users who participate in the survey, this similarity in population characteristics allows for a closer data link to be related between the two methods.

3.2.1.2 Emoji. Since emoji represent the semiotic processes of cartographic language, they were a mandatory addition to geotagged tweets to content analyze SCC. There are 2623 symbols from the emoji lexicon with different interpretive meanings (The Unicode Consortium; Danesi, 2017; Riordan, 2017); although, this study was not concerned about specific emoji characteristics and how they are interpreted by audiences. This content analysis was looking for occurrences of any emoji in the lexicon when coupled with a geohastag. This analysis did, however, take into consideration the eight different categories that emojis are organized within the lexicon as well as on users' mobile and computer keyboard options. These categories informed the study's second research question that asks how the cartosemiotic contexts of the posts relate to the type of semiotic processes, or emoji type. The emoji lexicon categories include: Smileys and people, animals and nature, food and drink, activity and sport, travel and places, objects, symbols, and flags; and each coder made note of particular symbol categories shared in each SCC post.

3.2.1.3 Cartosemiotic Contexts. To restate Schlichtmann's (2003) theme of cartosemiotics, the type of sign systems that are manifested in cartosemiotics are in addition to how humans engage with these signs, which stems from the context in which signs and processes are embedded; therefore, this content analysis coded the social media posts for occurrences of cartosemiotic contexts in order to answer the first research question looking to describe what contexts are commonly used when engaging in SCC. The contexts that were coded are adapted by definitions and themes of cartosemiotics from Wolodtschenko (2003), Schlichtmann (2003),

and Kepes (1967), which include: Modelling/communicating spatial knowledge, re-vitalizing forgotten spatial information, and sharing user's inner model of the outer world.

3.2.2 Message Sampling

Since a good practice in "content analysis sampling is to use a diverse sample as well as purposeful sampling strategy to capture heterogeneity," (Earp, Anton, Aiman-Smith, & Stufflebeam, 2005, p. 229) this message sample was derived from two social media platforms, Twitter and Instagram. Twitter is a widely used platform by a variety of ages, and Tweets are a common preference for sharing location information and hashtags (Liang, et. al., 2017). Instagram is another appropriate platform for sampling SCC posts, as geotagging was originally associated with photography shared in the digital realm (Seel, 2012; Gordon, 2007), which is the basis of Instagram sharing. Both Instagram and Twitter users often caption/share posts including assorted emoji as well, and these platforms have search engines that allow me to filter feed content to control for #[location] and (on Twitter) emoji.

Random sampling techniques were implemented in the content analysis in order to ensure the internal and external validity. This allowed for generalizability of the analyses descriptions, as well as the soundness of the instruments. A stratified random sample collected a sample of 40 emoji, used in coordination with a #[location], that was generalizable to the entire emoji lexicon; a systematic random sample was then used to gather a sample of these filtered social media posts. In order to collect a specific sample of social media posts/tweets that portrayed social cartosemiotic conduct, I used the search tool provided by each platform in order to specifically filter only content that included a #[location] and an emoji. A total of 500 posts/tweets were sampled to describe SCC.

3.2.2.1 Twitter. The Twitter advanced search tool is a directory that allowed me to search for tweets containing geo-hashtags with emoji, from any time period of my choosing. This tool generated my content analysis of tweets that portray social cartosemiotic conduct (SCC). Content analysis with manifest coding allowed patterns to emerge in terms of different contexts in which individuals conduct social cartosemiotics. Within the advanced search, I filtered or control for all posts that included hashtags: #fortcollins, #foco, #denver, #milehighcity, #coloradosprings, #colosprings, and #boulder; and emojis that were sampled from the 2623 symbols of the emoji lexicon. As described, the emoji were filtered as mandatory additions to geotagged tweets in this advanced tool; however, the tool only allowed 40 emoji to be searched at a time. Since the emoji lexicon is organized into categories, a stratified random sample was most appropriate (Wimmer & Dominick, 2014), and was implemented to collect 40 different emoji to represent the 2623; 5 emoji were collected form each 8 strata, or categories, that the emoji lexicon includes (Smileys and people, animals and nature, food and drink, activity and sport, travel and places, objects, symbols, and flags) in order for the 40 randomly selected emoji to be generalizable to the whole lexicon. The tweets that resulted from the geotag and emoji filter items in the advanced search tool were collected over a filtered timeline between January 1st, 2016, and January 1st, 2017, according to a systematic random sample (set by a random number generator). This systematic random sampling technique was conducted until 250 Tweets with SCC were collected from Twitter.

3.2.2.2 Instagram. Unlike Twitter, the Instagram platform only provides basic searches of posts according to location, hashtags, or people; therefore, emoji are not searchable through this feed. To reconcile this limitation, I searched each hashtag indicating users' geotag, and implement a similar systematic random sample, but I also oversampled to ensure a large enough

diversity in posts would yield 250 posts with both emoji and geotag. To collect 250 posts, that included a geotag and a representation of semiotic processing (Gaines, 2010; Kepes, 1967; Schlichtmann, 2003), the oversample included 500 posts, and the posts with both emoji and geotag were systematically sampled to finalize 250 posts for coder analysis.

3.2.3 Data Collection: Coding and Coding Scheme

After the appropriate random sampling techniques were used to collect 500 social media posts, each post was copied onto its own PowerPoint slide, and the slide number indicated the posts' 'case ID' when exported into the Excel codebook and then SPSS. Two coders (including the researcher) used a coding scheme to collect data indicative of SCC (Lombard, et al., 2010). The scheme guided each coder through a similar coding experience of counting occurrences of SCC (#[location] and emoji categories) of the post or tweet, and the context in which the post or tweet is presented. For testing frequencies in data, it is common practice to "code by reading through the text manually noting statement occurrences," (Earp, Anton, Aiman-Smith, & Stufflebeam, 2005, p. 229) especially because reliable automated coding computer programs are expensive and do not include capabilities to search for specific emoji symbols or hashtags. The coders, therefore, each received a package of the collected sample, and coded the social media content according to the coding scheme using an Excel-formatted codebook. "A coding scheme involves developing specific categories that will be used to analyze the content" (Allen, 2017, p. 246), these categories reflect the elements of SCC as outlined above in the Units of Analysis section. Research shows different ways, or mindsets, in which coders agree to code; the coding process for this study used deductive coding methods, which "involve[s] established theory to help guide the development of the categories" (Allen, 2017, p. 246). The theoretical framework

guiding this deductive method was the defined contexts of cartosemiotics, as well as the units of analysis, or elements of SCC, that were needed as a foundation for cartographic language.

An established coding scheme diminishes the chance of researcher bias and increases objectivity between multiple coders, which maintained internal validity and consistently measures the specific variables (Allen, 2017; Wimmer & Dominick, 2014). A pilot test of this content analysis was conducted in order to test the validity of the coding scheme. 10% of posts and tweets from a similar sample of the social media post population was collected and coded (Lombard, Snyder-Duch, and Bracken, 2010) individually by two coders—including the researcher—using the coding scheme; afterwards, the two coders discussed discrepancies with the results from their coding and clarified parts of the coding scheme as needed to capture the content that needs to be captured to ensure validity in the instrument and reliability among the coders' results (Lombard et. al., 2010). Reliability was reinforced, as multiple coders were trained to establish intercoder reliability, as specified in the following section of this chapter.

3.2.3.1 Coder Training and Intercoder Reliability. Intercoder, or interrater, reliability is defined as "the extent to which independent coders evaluate a characteristic of a message or artifact and reach the same conclusion" (Lombard, et al., 2010, p. 1). Coder training is essential to complete for a quantitative content analysis, since it is a step toward instrument validation, which establishes a high level of reliability, and because coder training "has the practical benefit of allowing the researcher to divide the coding work among coders" (Lombard, et al., 2010, p. 1). During this coder training of the study, the intercoder reliability index had to calculate .80 or higher (Lombard et al.); in order to attain this appropriate level of intercoder reliability for this content analysis, the systematic procedure and the results from this reliability analysis is outlined as follows.

Two coders (including the researcher) met to pilot test the coding scheme, as well as reach a significant statistic of intercoder reliability. First, to become acquainted with the coding scheme, five posts and tweets were collected (via the outlined systematic random sampling for this method), and the coders concurrently discussed aloud how they would code each post or tweet according to the scheme, as well as reconcile any confusion from the scheme to informally assess the reliability, and refine the instrument if necessary (Lombard, et al., 2010). No major changes were made to the scheme, as most of the discussion related to clarification of terms and the chances of odd specific coding cases. Suggested by Lombard, Snyder-Duch, and Bracken (2010), the coders were then given 10% of the content sample (25 tweets and 25 Instagram posts), which were previously drawn from the systematic random sampling as outlined previously. The coders were given two hours to individually complete their *pilot coding*[5] on their own time in their environment of choice (Lombard, et al., 2010). After pilot coding was complete, the pilot codes were analyzed through an appropriate SPSS index to establish a level of agreement that determined whether reliability was achieved are not.

According to Lombard and colleagues (2010), a different test for reliability is essential besides Cronbach's alpha or sole percent agreement. Rather, they promote indices including Holsti's method, Scott's pi (p), Cohen's Kappa (κ), and Krippendorff's alpha (α). Since my study relies on SPSS software, reliability was measured via SPSS's available index calculation Cohen's κ; although this measure was used out of convenience, this appeared to be an above adequate recommended index, as it is "commonly used in research that involves the coding behaviors" (Lombard, et al., 2010, p. 1) despite critiques on its drawbacks by competing index founders (i.e. Krippendorff).

[5] Similar to pilot testing in which the reliability of the instrument is tested in the same conditions as the coders will be in during actual coding process.

After running Cohen's κ from pilot coding, the coders did reach a significant intercoder reliability within the outlined index parameters, so they did not need to meet to adjudicate codes or run another 10% sample through a second pilot coding session (Lombard, et al., 2010; Wimmer & Dominick, 2014). As displayed in Table 3.1, Cohen's κ test for interrater reliability was ran to determine if there was agreement between the two coders' judgement of shared geotags, emoji category, and SCC context in the social media posts. Overall, there was strong reliability results from each Cohen's κ test.

Table 3.1

Cohen's κ Tests for Interrater Reliability

Codes	*κ*	*p*-Value
Shared Geotag	.969	.000
Shared Emoji Category	1.0	.000
SCC Context	.744	.000

Note. $N = 50$ Twitter and Instagram Posts.

3.3 Survey

When combined with a descriptive content analysis, an analytical survey of self-reported SCC added depth to this study by defining commonalities between descriptive data of SCC and how users self-report this conduct (RQ6). Using specific questions to represent operationalized variables, survey method helps gage this online communication and other message elements, such as behavioral intent, and supplement formative research (Dillman, 2016; Wimmer & Dominick, 2014; Balnaves & Caputi, 2001). In particular, this online survey of social media users also allowed for data collection that tested correlations between (self-reported) SCC on social media platforms and user concern for privacy, spatial awareness, and social perspective (RQ3, RQ4, RQ5). In regard to survey instrument design, this study will follow guidelines set by

Dillman (2016); for example, a consistent layout and response pattern was used to limit cognitive load, and only a few questions per page were presented to help the respondent focus on the questions at-hand rather than speed through (Dillman, 2016). To gather self-reported SCC, a survey was chosen over in-depth interviews because survey method best complements content analysis (Neuendorf, 2017) in multi-quantitative studies, and because the variables tested through correlations reflect—generally— the degree of social media users' attitudes, concerns, and understandings, which is best captured through Likert scales (Wimmer & Dominick, 2014). The scales/indexes used in this survey to measure user concern for privacy, and social perspective, were adapted from other studies that implemented survey method and Likert style questions (Morais & Ogden, 2010; Stewart & Segars, 2002; Smith et. al., 1996), therefore reinforcing the use of this method in addition to content analysis.

An online survey was the most appropriate method for data collection for this study because the population includes individuals who are active on social media platforms, and therefore comfortable with online environments—perhaps more so than print-based surveys—with a higher technological capability compared to populations who are not active on social media (Dillman, 2016). Qualtrics software is used to develop the questionnaire to be optimized for desktop use, as well as mobile (browser or app based) (Dillman, 2016), in order to accommodate this technological savvy population and their various preferences of digital devices.

3.3.1 Population and Sampling

The population of this study includes all social media users who use their computer or mobile device for SCC, intentionally or intuitively. Within the limits of this study's timeframe and budget, the survey method consisted of a convenience sample of undergraduate students at

Colorado State University (CSU). Although a convenience sample, this group of respondents reflected the populations' characteristics of social media users who are familiar with sharing social media symbols (emoji, bitmoji, and/or images), as well as social media geotags such as #[location], geofilters on pictures, and/or shared location pinpoints on textual and/or pictorial posts. Therefore, undergraduate students of CSU were sampled as a convenience, but also as an accurate representative of this study's population; undergraduate students are primarily within the millennial generation, which consists of the heaviest social media users and online communicators (Pew Research, 2017). Unfortunately, this reflection of the population is not statistically generalizable due to non-probability sampling (Wimmer & Dominick, 2014; Dillman, 2016). Since there are about 22,000 undergraduate students enrolled at Colorado State University, and this study sought a 95% confidence level, a convenience sample of 584 students was pursued (Creative Research Systems, 2012). Since online surveys typically have low response rates (Dillman, 2014), the Dillman method was used to design an effective survey and reach an estimated response rate between 50-60% (Dillman, 2014); therefore, to ensure n=584, I exceeded this number (n=1010) when recruiting respondents. Ultimately, 144 students completed the survey, once insufficiently complete surveys were removed from the dataset (16 were considered too incomplete to include). This amounts to a 15% response rate.

3.3.2 Recruitment and Pilot Test

This study implemented techniques suggested by Dillman's (2016) survey method and design expertise. Since questionnaires are commonly associated with consumer feedback, government files/documents, and training or exams, surveys are viewed in an undesirable light by most individuals. In order to reduce people's reluctance to respond to surveys, Dillman (2016) emphasizes applying different modes of social exchange, pilot testing to ensure

understandability, as well as promoting an incentive when applicable. Accordingly, the following paragraphs systematically define how I piloted the survey design and logic, and then recruited respondents for this survey.

3.3.2.1 Pilot Testing. Survey "measures are more suspect, especially when they rely on self-report responses," (Neuendorf, 2017, p. 38) so pilot testing is necessary to test the reliability of the instrument and make changes to the design or questionnaire language top optimize respondent comprehension as well as response rate and accuracy. Before the survey was distributed, the survey questions underwent a pilot test from five pilot participants who shared characteristics with the study's sample in order to gage the efficiency of the survey design and if the questions were confusing and/or understood (Dillman, 2016; Wimmer & Dominick, 2014). Pilot participants underwent concurrent and retrospective sessions with the researcher in order to test the usability and validity of the survey instrument. Concurrently, the participants navigated the questions verbally, explaining their reasoning behind their responses and any concerns they encountered. The researcher made note of these responses and asked the participant to clarify any unclear decisions, reasoning, or confusion behind their survey taking during the pilot. Through concurrent questioning, minor awkward phrasing in the survey items, and font inconsistencies were reconciled. Upon completion of the survey, pilot participants were asked retrospective questions regarding certain blocks and their overall survey experience. Since this survey will include jargon such as geotag, hashtag, spatial information; and conceptual terms such as privacy, I also clarified that the participant understood these terms throughout the survey. Their retrospective input led to the inclusion of a progress bar for participants to gage their completion during the survey, as well as a check-all-that-apply/matrix-style question in the

demographics block asking participants to indicate their ethnicity. The IRB-approved survey was then ready for sample recruitment and data collection.

3.3.2.2 Recruitment Since this online survey was conducted from a convenience sample of undergraduate students at Colorado State University, the permission of their corresponding professors, as well as IRB approval, was attained before the online survey was distributed. My first social exchange with potential respondents was presenting a brief face-to-face verbal script in order to start building trust and credibility (Dillman, 2016) with potential participants. This script explained the purpose of the study in general lament terms, indicated the 8-10-minute length of the survey (which was determined via pilot testing), and encouraged the students to participate with a lottery incentive (as allowed by the class professor). This script was followed by an email invitation, and two reminder emails, which were adapted from IRB templates and Dillman's (2016) web invitation and reminder email examples. Throughout these social exchanges and recruitment material, voluntary participation and confidentiality was stressed as requirements in this study's objective.

Moreover, all participant names and identifying information were kept separate from the survey answers, to maintain confidentiality. At the end of the survey, the participants were provided a link to a page separate from the survey where the participant entered their name and email for the lottery draw of one of five $10 Amazon gift cards. The data from the first 20 completed surveys was exported from Qualtrics to SPSS in order to conduct pretesting and internal reliability analyses; after appropriate adjudications were made to the items due to pretest results, the rest of the data collection was exported from Qualtrics to SPSS in order to conduct data analyses via correlation testing to answer the study's hypotheses.

3.3.3 Instrumentation: Variables and Scales

Four variables were tested using five-point and seven-point Likert scales in this survey: SCC engagement, concern for privacy, spatial awareness, and social perspective. This section will outline each variable and its corresponding adapted scale used in the questionnaire design and to measure respondents' answers.

***3.3.3.1 Spatial* Awareness.** Understanding and measuring Spatial Awareness (SpA) is essential in fields pertaining to aviation and engineering to maintain safety and control (Bolton, & Bass, 2007), as well an important element for GIS experts and users (Pickles, 2000; Pavlovskaya, 2016; Peterson, 2015); moreover, the degree of SpA, as it is defined in section 2.2.1 of this proposal, is now an important resulting factor to consider from social media engagement, as users will often communicate or share their surroundings, objects of their surroundings, as well as their opinions or understanding of these surroundings.

Data on individual spatial awareness was collected according to comparing how long participants (Colorado State University students) have lived in Fort Collins, and how often they use a GPS to get around their current area. In order to account for reliability in this study, the city of Fort Collins (home of this study's convenience sample) was specified as the screened location throughout this survey block. Participants specified the length of time they had lived in Fort Collins, and/or attended CSU in Fort Collins as a student. This was collected and measured as a control variable in Spatial Awareness survey block because a respondent's length of time in and familiarity of the city will hypothetically moderate a respondent's spatial awareness. The survey consists of close-ended questions that feature Likert questions (strongly disagree to strongly agree), which reflect the Levels of SpA (Bolton & Bass, 2007). Bolton and Bass (2007) designed an experimental study that effectively tested individual spatial awareness; however, their study

does not include an applicable survey scale, rather overarching items in their SpA definition to be considered. The survey questions that examined spatial awareness were derived from their theoretical definition, by adapting their dimensions (three levels) of SpA into Likert scale items to test the correlation of spatial awareness and social cartosemiotic conduct. To translate these objective measures of SpA to a more transferable and self-perceived measure, I adapted the levels of SpA into Likert survey questions that are specific to a respondent's knowledge of Fort Collins to add subjective relatability; as well as emphasized spatial awareness as a preference when navigating surroundings, rather than a determinant skill set.

Accordingly, the survey questions reflected Bolton and Bass's (2007) leveled measurement of SpA in order to evaluate my study's participants' spatial awareness, as outlined in Table 3.2.

Table 3.2
Survey Questions to Evaluate Fort Collins Residents' Spatial Awareness Preference. Adapted from Bolton & Bass (2007)

Level of SpA	**Likert Survey Question** *"As a Fort Collins resident, to what degree do you agree or disagree with the following questions?"*
The extent to which a person notices objects in the environment	When I travel around Fort Collins, I prefer to use memorable landmarks to navigate, rather than a map. I tend to notice unique buildings or landmarks in a new place before most people do. While driving, biking, walking, or running around Fort Collins, I always notice obstacles in my path in advance.
	I am confident travelling to an unfamiliar place without consulting a GPS.

The extent to which a person understands where objects are in the environment	I am confident in my ability to communicate directions to someone looking for a nearby grocery store in Fort Collins. I believe I am fully aware of most objects (i.e. buildings, roads, landmarks, etc.) in my Fort Collins surroundings.
The extent to which a person understands where objects will be in the future	If I use a GPS to travel to an unfamiliar place, I am confident in re-tracing my steps without consulting a GPS. If I use a GPS to travel to an unfamiliar place, I will not have to use the GPS to travel there again in the future. I am confident travelling to familiar places without consulting a GPS. I will always use a GPS.

3.3.3.2 Social Perspective. The definition of this variable is an extension and accumulation of worldmindedness (Sampson & Smith, 1957), and Global Mindedness (Hett, 1993). "The concept of worldmindedness designates purely a value orientation, or frame of interest in, international relations" (Sampson, & Smith, 1957, p. 99), and Sampson & Smith (1957) evaluates that a "highly worldminded individual [would] favor a world-view of the problems of humanity, whose primary reference group is mankind, rather than Americans, English, Chinese, etc. Such a person may or may not have a heightened interest in and knowledge about international affairs...[or] political relations" (p. 99). Sampson and Smith (1957) included eight dimensions of worldmindedness that constitutes sub-scales within the scale including immigration, religion, government, education, economics, race, patriotism, and war. From each of these sub-scale dimensions extends four relating questions; of those four, two questions are anti-woldminded and two are worldminded. This scale was widely recognized

across disciplines to study individual global attitudes, sense of social responsibility, and proxemics; however, although the humanity dimensions of this scale are still relevant in today's society, the context underlying each Likert statement was dated. Many scholars have replicated and adapted this scale into more timely contexts, the most popular being Hett's (1993) Global Mindedness Scale that was specifically "created to overcome the outdatedness of the Worldmindedness Scale" (Vassar, 2006, p. 5).

Hett (1993) defined Global Mindedness as "a worldview in which one sees oneself as connected to the world community and feels a sense of responsibility for its members. This commitment is reflected in attitudes, beliefs, and behaviors" (p. 143). Seventeen years later, Morais and Ogden (2010) developed a "theoretically grounded and empirically validated scale to measure global citizenship" (p. 1) that would advance the way social perspective, competency, and citizenship is measured by accumulating multiple scales, including Hett's (1993) scale. Morais and Ogden's (2010) Global Citizenship Scale (GCS) takes into account three different dimensions that constitute its definition in their study: social responsibility, global competence, and global civic engagement. Their study concluded that social responsibility needed more operationalization as a sub-dimension, but "Global competence and global civic engagement are both strong dimensions of global citizenship and each has three reliable sub dimensions that substantiate the proposed conceptual scope of the scale" (Morais, & Ogden, 2010).

In comparison to my variable of social perspective, global competence and its sub-dimensions of self-awareness, intercultural communication, and global knowledge, highly relate and were adapted to the measurement of social perspective as a result of social cartosemiotic conduct.

Table 3.3
Dimensions of Global Citizenship (Morais & Ogden, 2010, p. 5)

	Global Competence
Description	Understanding one's own and others' cultural norms and expectations and leveraging this knowledge to interact, communicate, and work effectively outside one's environment
Core Assumptions	Self-awareness, intercultural communication, global knowledge
Sample Perspectives	"I am informed of current issues that impact international relations" "I am able to mediate interactions between people of difference cultures by helping them understand each other's values and practices"

The measurement model of Global Competence is indicated with the green shaded section of the GCS in Figure 3.3, and its defined dimensions are organized in Table 3.3. The corresponding survey questions for global competence are as outlined in Figure 3.2 to indicate how social perspective was measured in my study via 5-degree (strongly agree to strongly disagree) Likert questions.

Global competence (GC): self-awareness
GC.1.1 I am confident that I can thrive in any culture or country.
GC.1.2 I know how to develop a place to help mitigate a global environmental or social problem.
GC.1.3 I know several ways in which I can make a difference on some of this world's most worrisome problems.
GC.1.4 I am able to get other people to care about global problems that concern me.
Global competence: intercultural communication
GC.2.1 I unconsciously adapt my behavior and mannerisms when I am interacting with people of other cultures.
GC.2.2 I often adapt my communication style to other people's cultural background.
GC.2.3 I am able to communicate in different ways with people from different cultures.
GC.2.4 I am fluent in more than one language.
GC.2.5 I welcome working with people who have different cultural values from me.
GC.2.6 I am able to mediate interactions between people of different cultures by helping them understand each other's values and practices.
Global competence: global knowledge
GC.3.1 I am informed of current issues that impact international relationships.
GC.3.2 I feel comfortable expressing my views regarding a pressing global problem in front of a group of people.
GC.3.3 I am able to write an opinion letter to a local media source expressing my concerns over global inequalities and issues.

Figure 3.2: 13-Item Scale for Global Competence (Morais & Ogden, 2010, p. 9)

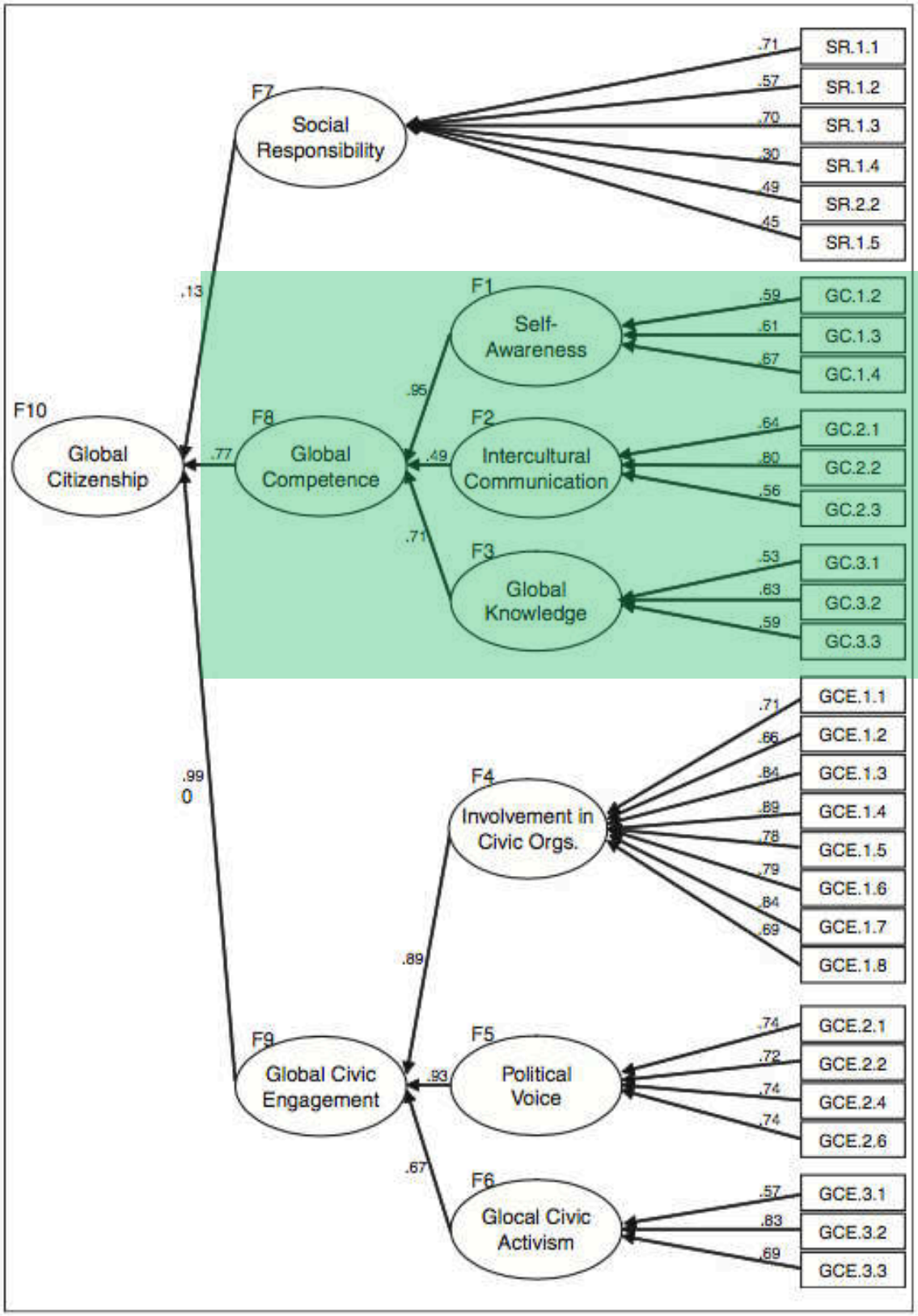

Figure 3.3: Measurement Model of The Global Citizenship Scale (Morais & Ogden, 2010, p. 15)

3.3.3.3 Concern for Privacy. Liang et. al. (2017) emphasize that "privacy is a culturally specific phenomenon," (p. 1476) and the permeation of technology in daily lives propels cultural change. Furthermore, individuals are spending more time building relationships and seeking information in online realms in order to build what now seems to supersede privacy: social capital. In order to analyze individuals' concern for privacy, and how social capital—such as that through SCC— has or has not superseded Concern for privacy, my study adapted items from the Concern for Information Privacy Scale (CFIP) (Smith et. al. 1996). This scale was originally created to test employees' concern for information privacy at their workplace in order to further measure strategic communication practices (Smith et. al. 1996; Stewart & Segars, 2002). Although this scale is dated, the items were empirically analyzed and re-tested by Stewart and Segars (2002) who concluded that the CFIP is still an accurate measure for concern for privacy in this generation of communication research. To scale concern for privacy of online information, which is the focus of my study, the CFIP was adapted to fit variables of my study, such as using the word 'social media' rather than 'company' (As seen in Table 3.4).

Table 3.4
Adapted Scale Items from CFIP

"Here are some statements about personal information. From the standpoint of personal privacy [in online environments], please indicate the extent to which you, as an individual, agree or disagree with each statement" (Smith et. al. CFIP, 1996)	
Item from CFIP (Smith et. al., 1996)	**Adaptation(s) Proposed for SCC Study**
It usually bothers me when companies ask me for personal information.	It usually bothers me when social media platforms ask me for personal information.
When companies ask me for personal information, I sometimes think twice before providing it.	When social media platforms ask me for personal information, I sometimes think twice before providing it.
It bothers me to give personal information to so many people.	It bothers me to give personal information to so many people through social media.

	It bothers me to give personal information to so many people in offline environments.
1 am concerned that companies are collecting too much personal information about me.	I am concerned that social media companies are collecting too much personal information about me.
Companies should devote more time and effort to preventing unauthorized access to personal information.	Social media companies should devote more time and effort to preventing unauthorized access to personal information.
Companies should take more steps to make sure that the personal information in their files is accurate.	Social media companies should take more steps to make sure that the personal information in their databases is accurate.
Companies should have better procedures to correct errors in personal information.	Social media companies should have better procedures to protect personal information.
Companies should devote more time and effort to verifying the accuracy of the personal information in their databases.	Social media companies should devote more time and effort to verifying the accuracy of the personal information in their databases.
Companies should not use personal information for any purposes unless it has been authorized by the individuals who provided the information,	Social media companies should not use personal information for any purposes unless it has been authorized by the individual who shared the information.
When people give personal information to a company for some reason, the company should never use the information for any other purpose.	When people share personal information on social media, the social media company should never use the information for any other purpose.
Companies should never sell the personal information in their computer databases to other companies.	Social media companies should never sell the personal information in their computer databases to other companies.
Companies should never share personal information with other companies unless it has been authorized by the individuals who provided the information.	Social media companies should never share personal information with other companies unless it has been authorized by the individual who shared the information.
Computers are a real threat to privacy in this country	Social media are a real threat to privacy in this country.

Sometimes I am afraid the data processing department will lose my data.	Sometimes I am afraid that social media platforms will lose/erase information on my profile
I am anxious and concerned about the pace of automation in the world.	I am anxious and concerned about the pace of automation in the world.
I am easily frustrated by computerized bills.	I am easily frustrated by social media platforms suggesting I share my personal information.
I am sometimes frustrated by increasing automation in my home.	I am sometimes frustrated by the increasing amount of social pressure to share my personal information on social media.
"How likely are you, within the next three years to. . ." (5-degree, very likely to very unlikely)	
Decide not to apply for something like a job, credit, or insurance because you do not want to provide certain kinds of information about yourself?	Decide not to download an app or social media feature because you do not want to provide certain kinds of information about yourself?
Refuse to give information to a business or company because you think it is too personal?	Refuse to share information on social media because you think it is too personal?
Take action to have your name removed from direct mail lists for catalogs, products, and services?	Take action to have your profile removed from a social media platform? Take action to have your name changed on a social media profile?
Refuse to purchase a product because you disagree with the way a company uses personal information?	Refuse to create a profile on a social media platform because you disagree with the way it uses personal information?

Questions where added to this concern for privacy survey block that address when users share their location on social media on a scale of the day before they go to that location (or earlier) to the day after they leave that location (or longer); hypothetically, when a user shares a social media SCC post, the closer (in time and proximity) a user is to the location shared, the less concerned they are with the privacy of their location.

3.3.3.4 Social Cartosemiotic Engagement. From my knowledge and research, there is no existing scale for SCC; however, there are defined contexts of cartosemiotics, and elements of SCC that have to be shared such as a geotag and symbol. Therefore, data on SCC was collected according to an individual's frequency and nature of sharing posts that include #[location] and social symbol; for example, how many posts (on a scale of All of My Posts to None of My Posts) include emoji, as well as a #[location]. SCC was also described by the type of platform users perform this conduct with different types of geotags and social symbols users share on each platform (outlined in Table 3.5), which was captured via matrix style question. The following Table 5 does not show relationships, rather simplifies the nature of SCC in what elements are considered in the frequency of such sharing on social media platforms.

Table 3.5
Elements of SCC for Frequency Testing via Survey

Platforms	Geotags	Symbols	Contexts
Twitter	#[location]	Emoji	Model/communicate spatial knowledge
Instagram	Geotagged coordinates (Add/share location option for posts)	Bitmoji	Re-vitalize forgotten spatial information
Facebook	GeoFilters	Picture	Share users' inner model of the outer world
SMS Messenger		Gif	
SnapChat			

3.3.4 Survey Pilot

Once the survey underwent appropriate pilot testing and recruitment, a pilot was conducted in order to test the internal consistency, or reliability, of the survey items and scales. The scale items were tested with Cronbach's alpha in SPSS software in order to test for

reliability of the measures; this is commonly used if a survey includes multiple Likert style questions that form a scale, and determining the reliability of the scale is necessary (Laerd Statistics, 2013). If the Cronbach's alpha output was less than 0.8 for any of the three adapted scales, the scale would not have been sufficient to measure this study's variables (Laerd Statistics, 2013) and there would be skewed significance in the results of correlations in data analysis. The first 20 completed surveys were cleaned and—as a result of data cleaning— 13 were used for reliability analysis for each of the scales. Fortunately, changes were not needed within the items of the concern for privacy scale (22 items; $\alpha = .845$) and the social perspective scale (13 items; $\alpha = .861$), as their reliability analyses reported a high level of internal consistency. Small changes were made to the items in the spatial awareness scale, as its original set of items were less than moderately reliable (10 items; $\alpha = .556$). After consulting the SPSS Cronbach's alpha analysis, it was calculated that when the last item on scale was deleted ("I will always use a GPS"), the internal consistency of the items was found to be highly reliable (9 items; $\alpha = .809$). This item was deleted, and a second Cronbach's alpha pretest was run in order to confirm the reliability of the spatial awareness scale. Additionally, data were inspected to ensure the survey flow (order of questions, skip/display logic, etc.) was operating as intended and to determine a range of time respondents spent taking the survey to more accurately report that in the recruitment scripts for the fielding of the survey with the intended sample.

3.4 Data Analysis

Due to monetary constraints of this proposed study, differing participants and sampling techniques were implemented for each method, which did not allow correlations to be made between the results of the descriptive and analytical methods of SCC; however, both methods are necessary to answer the research questions of this study, since the content analysis variables and

data relate to the variables tested from the survey. More measures yield a more informed study (Neuendorf, 2017; Allen, 2017; Riffe et. al., 2014), specifically in how the survey provides a more analytical insight to what the content analysis results suggest about SCC.

The research questions and hypotheses are answered through the accumulation of data analysis from these two quantitative methods. My first research question—in what context(s) do social media users share posts that include both a geotag and an emoji? — was answered using frequency tests of contexts coded as a unit of analysis in the content analysis; the frequency percentages from the descriptive statistics indicated the most common context in which individuals partook in SCC.

My second research question—Does the context of SCC in social media posts relate to the choice of emoji category/symbol processes? — was answered through descriptive statistics and a Chi-Square analysis, in which the relationships between independent variables SCC contexts and emoji categories shared was examined. Percentages of emoji categories shared were reported, followed by a Chi-Square crosstabs showing how these categories related to each SCC context.

My research questions three, four, and five (and their matching hypotheses H1-H3) pertain to how a users' engagement in SCC can affect their concern for privacy, spatial awareness, and/or social perspective. These questions and hypotheses were tested via running correlations through SPSS between the survey data on SCC engagement (self-reported sharing of #[location] and emojis), and the coordinating scale for each independent variable (CFIP for privacy, Global Competence for social perspective, and adapted Boston & Bass measurement for spatial analysis).

My sixth research question—are there commonalities between the descriptive data of SCC and how users self-report this conduct? — was not answered via statistical analysis or correlations, as the sample for each method was different and therefore the methods' data cannot be statistically correlated. Furthermore, the answer to this hypothesis revolved around discussing how the findings from each method related to one another in furthering the understanding of SCC.

3.5 Limitations

In order to control for certain methodological limitations, this study supplies two methods to address disadvantages of one with advantages of another, as "the various methods' strengths and weaknesses tend to balance out" (Neuendorf, 2017, p. 38). For example, self-reported data via online survey is mediated through uncontrolled respondents' mental state and environment, which might have an effect on their answers; however, the content analysis focusses on the message itself without the mediation of the messengers' ability to answer a question, which reduces this limitation (Allen, 2017). One major limitation in implementing a content analysis is the potential for researcher bias, or internal reliability. This is controlled for in my study through pilot testing and pretesting the scales of the instrument, and establishing intercoder reliability with multiple coders through coder training and Cohen's K (Laerd Statistics, 2013; Lombard, et. al., 2010). Overall, steps are taken in my study to ensure my instruments are clear and effectively measuring variables to answer my research questions and address my hypotheses.

The two greatest limitations of this study involve the lack of generalizability of the survey data to the overall population of social media users who perform social cartosemiotic conduct (SCC), as this is a non-probability sample (Wimmer & Dominick, 2014), and the content analysis confinement to two social media platforms, which will not be statistically

generalizable to all social media platforms. The limitation of social media platforms is reduced by including two different platforms in my content analysis, rather than only one, as well as including frequencies of multiple social media platform usage in my survey items. Snap Chat is another social media platform that would ideally be analyzed in my content analysis due to the popular use of geofilters used to geotag snaps/pictures; however, the platform does not easily allow for filterable searches compared to Twitter and Instagram. To reconcile this gap in research, the survey method of this study asked a matrix-style question pertaining to geotag and social symbol use on the Snapchat platform (as well as other platforms) to gather exploratory data specific to other platforms.

As highlighted at the beginning of this section, the two proposed methods share similarities in advantages, but also share limitations as well; for example, the question of internal validity: "Just as the self-report nature of most surveys calls into question the objectivity and validity of their measures, so too the involvement of human decisions in the content analysis coding process calls into question the validity of the coding scheme" (Neuendorf, 2017, p. 38). In order to control for this potential limitation that both methods share in reliability and validity, pilot and pretests were conducted and re-conducted when necessary to test both instruments (questionnaire and coding scheme), and strong intercoder reliability was confirmed via Cohen's κ in order to eliminate any subjective decision making when following the coding scheme.

CHAPTER 4. RESULTS

This chapter provides data findings from both the descriptive and analytical methods of this study. Specifically, the content analysis of social media posts from Twitter and Instagram defined the SCC contexts and symbol processes, through descriptive statistics, answering RQ1 and RQ2. The survey of users' self-reported SCC on social media indicated the effect, or lack thereof, that their SCC had on their self-reported concern for privacy, spatial awareness, and social perspective; these results correspond to answering RQ3-5. Lastly, although no relationship can be determined between the data from each method, the findings from both methods were examined in unison to report any commonalities between the descriptively analyzed SCC and self-reported SCC; this discussion answered RQ6.

4.1 Content Analysis Findings

This content analysis quantitatively reviewed 250 Tweets and 250 Instagram posts that portrayed elements of SCC, specifically the combination of an emoji and #[location]. This approach combined the necessary cartosemiotic components of a geotag and a symbol to express underlying map language. Through random stratified sampling, with eight strata, 40 emoji were collected to accurately represent the emoji lexicon in this analysis. In the Twitter platform, these emoji and the seven #[locations] representing northern Colorado were filtered within the controlled timeframe of January 1st, 2017, and January 1st, 2018. Instagram posts were collected through search filtering the same northern Colorado hashtags, and then systematically random sampling the posts that also included any emoji present. 30% of all collected posts via systematic random sampling was coded by the piloted second coder, whose reliability was confirmed through strong Cohen's Kappa results.

4.1.1 Research Question 1: SCC Contexts

The following data informs RQ1: In what contexts do social media users share SCC? Descriptive statistics were determined through an SPSS analysis, reporting the measures of central tendency and percentages for each SCC context. Table 4.1 reports the frequencies for each context, showing that most SCC in social media posts from this study's content sample occurred when a user is shared their inner model of the outer world (M = 1.03, SD = .97). In close second, modeling/communicating spatial knowledge was another prominent context in which Twitter and Instagram users shared SCC. SCC was characterized least frequently by users re-vitalizing forgotten spatial information.

Table 4.1
Context of User's Social Cartosemiotic Conduct

SCC Contexts	Frequency	Percent
Shares User's Inner Model of the Outer World	242	48.4
Model/Communicate Spatial Knowledge	228	45.6
Re-Vitalize Forgotten Spatial Information	30	6.0

Note. N = 500 Twitter and Instagram Posts.

In other words, Twitter and Instagram users frequently used the combination of #[location] and emoji to explain their personal connection to their indicated place in the post, or used this cartosemiotic combination to present a piece of themselves or their lives in respect to the greater whole (defined by their #[location]). These findings show that social media users are also likely to show their opinion, review, or expertise of or in a place (defined by their shared #[location]) through SCC on Twitter and Instagram.

4.1.2 Research Question 2: Emoji Categories Shared and SCC Contexts

The following data reflects the answer to RQ2: Does the context of SCC relate to users' shared emoji category? Table 4.2 illustrates the total emoji shared through social media posts (N = 500, M = 1.92, SD = 2.34), specifically the most prominently shared emoji categories across Twitter and Instagram that were in combination with northern Colorado #[locations].

Table 4.2
Shared Emoji Categories

Emoji Category	N	Percent
Smileys & People	287	32.6
Animals & Nature	178	20.2
Symbols	128	14.5
Objects	98	11.1
Food & Drink	67	7.6
Activity & Sport	64	7.3
Travel & Places	42	4.8
Flags	17	1.9

Note. The total N = 864 exceeds the sample size N = 500 because there can be multiple categories per social media post.

Emoji that belong in the lexicon category "Smileys & People" and "Animals & Nature" were most prominent in SCC on Twitter and Instagram. Symbols and Objects were also worth recognizing as continuously occurring emoji when social media users performed SCC. After analyzed frequencies, a Chi-Square test of independence was performed to examine the relationship between SCC contexts and emoji categories shared; the crosstab of these variables is presented in Table 4.3.

Table 4.3
Variable Crosstab: Emoji Category Shared and SCC Context

Emoji Category	Model/Communicate Spatial Knowledge	Re-Vitalize Forgotten Spatial Information	Shares User's Inner Model of the Outer World
Smileys & People	96	20	103
Animals & Nature	44	6	41
Symbols	28	1	33
Objects	17	0	23
Food & Drink	24	1	7
Activity & Sport	10	1	20
Travel & Places	4	1	7
Flags	5	0	8

The Chi-Square relationship between these two variables was significant ($X^2 = 26.25$, $p = .024$), which reports that there was a statistically significant ($p < .05$) association between emoji categories on social media and the SCC contexts in which they are shared. This relationship specifically notes that Twitter and Instagram users most likely added to their #[location] an emoji from the Smileys & People category while sharing within any three SCC contexts, primarily when sharing their inner model of the outer world. When specifically modelling/communicating spatial knowledge, users also tended to share Animals & Nature and Food & Drink emoji more than in any other SCC context. When specifically sharing their inner model of the outer world, users tended to share Symbols, Activity & Sport, and Flags emoji more than in any other SCC context. During SCC in the least prominent context, re-vitalizing forgotten spatial information, users usually did not share Objects or Flags emoji, and focused on Smileys & People and Animals & Nature emoji.

4.2 Survey Findings

The online survey via Qualtrics was completed by 160 CSU undergraduate students (15% response rate), and after data cleaning in SPSS $N = 144$ fulfilled the final dataset. This

survey prompted respondents to self-report their level of sharing SCC on social media, including: how many of their posts contain #[location], emoji, and a combination of #[location] and emoji. The survey then measured their concern for privacy, social perspective, and spatial awareness through various Likert-style items on three different scales. The data were used to test for significant relationships between social media users' SCC and their concern for privacy, social perspective, and spatial awareness. In order to maintain reliability and validity, the survey logic and scales were pretested with concurrent and retrospective questioning about the survey design and items, and Cronbach's alpha determined all scales as reliable in a pretest. This measure was re-tested to confirm the reliability of each scale in the final dataset, including: concern for privacy (22 items; $\alpha = .877$), spatial awareness (9 items; $\alpha = .559$), and social perspective (13 items; $\alpha = .836$). The following sections outline the results of the survey data analyses that correspond to RQ 3, 4, and 5, as well as corresponding hypotheses.

4.2.1 Research Question 3: Concern for Privacy

The following data reflects the answer to RQ3: How does SCC on social media platforms relate to user concern for privacy? Table 4.4 reveals the statistically significant relationship between social media users' SCC and their concern for privacy.

Table 4.4
RQ 3 Correlations

Dependent Variable		SCC	#[location]	Emoji
Concern for Privacy	Pearson Correlation	-.218	-.117	-.090
	Sig.	.009	.165	.288

Note. *N* = 144

Although the Pearson Correlation showed that the magnitude of this relationship is moderately low, the negative correlation between self-reported SCC and the calculated concern for privacy shows that the more users partake in SCC in social media, the lower their concern for privacy

will be. This confirms hypothesis H1: If individuals self-report a high engagement of SCC, then their concern for privacy will be lower.

4.2.1.1 When Users Share and Concern for Privacy. In addition to running correlations with the concern for privacy scale, this data analysis examined how SCC engagement relates to when social media users share their locations. Overall, the Social media users partaking in SCC who agreed they share on social media *before* going to the shared location ($M = 1.54$, $SD = .923$) had lower concern for privacy ($r = -.219$, $p < .01$); users who agreed they shared on social media *while* they are at the shared location ($M = 2.79$, $SD = 1.50$) have lower concern for privacy ($r = -.198$, $p = .05$); and users who agreed they share on social media *after* they leave the shared location ($M = 2.95$, $SD = 1.49$) also have lower concern for privacy ($r = -.274$, $p = .001$). The analyzed means indicated that most people tend to agree they share SCC after leaving their shared location; however, this did not indicate a positive correlation with concern for privacy, which means users have another reason besides privacy to wait to share their locations online.

4.2.2 Research Question 4: Spatial Awareness

The following data reflects the answer to RQ4: How does SCC on social media platforms relate to user spatial awareness? Table 4.5 reports the results of the correlation analysis between these two variables.

Table 4.5
RQ 4 Correlations

Dependent Variable		SCC	#[location]	Emoji
Spatial Awareness	Pearson Correlation	-.118	-.093	.080
	Sig.	.157	.265	.343

Note. $N = 144$

In this study's dataset, the relationship between spatial awareness and SCC engagement is not statistically significant (p = .157). In addition, though the spatial awareness scale was reliable in this study's pretest (9 items; α =.809), this was not the case after running Cronbach's alpha for spatial awareness on the final dataset (9 items; α = .559). Therefore, H2: if individuals self-report a high engagement of SCC, then their spatial awareness will be higher, and RQ4 could not be determined.

4.2.3 Research Question 5: Social Perspective

The following data reflects the answer of RQ5: How does SCC on social media platforms relate to user social perspective? Table 4.6 reveals how individuals' social perspective was not related to SCC engagement (sharing #[location] and emoji in combination); however, there was a relationship between social perspective and sharing emoji, as well as between self-awareness (a sub-scale of social perspective) and sharing #[location] on social media.

Table 4.6
RQ 5 Correlations

Dependent Variable		SCC	#[location]	Emoji
Social Perspective	Pearson Correlation	.019	.149	.175
	Sig.	.823	.075	.037
Self-Awareness	Pearson Correlation	.025	.202	.115
	Sig.	.768	.015	.170
Intercultural	Pearson Correlation	.034	.021	.122
Communication	Sig.	.685	.801	.147
Global Knowledge	Pearson Correlation	-.118	.004	.042
	Sig.	.160	.964	.614

Note. N = 144

Although the Pearson Correlations showed that the magnitudes of each relationship were moderately low, the positive correlations were still significant in defining SCC. First, the relationship between self-reported emoji sharing and the calculated social perspective shows that the more users share emoji in social media, the higher their social perspective will likely be.

There is also a positive, moderately low, correlation between users' self-reported #[location] sharing and the calculated sub-scale of social perspective, self-awareness. These correlation results do not specifically answer H3: If Individuals self-report a higher engagement of SCC, then their social perspective will be lower, as there is no significant relationship between SCC and social perspective. This analysis shows, however, that sharing emoji positively correlates with individual social perspective, and sharing #[location] positively correlations to self-awareness.

CHAPTER 5. DISCUSSION

This final chapter examines the theoretical and practical implications of this study's findings in order to define how Social Cartosemiotic Conduct (SCC) exists in social media platforms, and how this conduct was reported by social media users. The existence of underlying map language, or cartosemiotics, in social media is a form of computer-mediated communication that should not be overlooked. As technology transcends boundaries between media from differing disciplines, new lenses on communication habits are necessary. This study, for example, defined the synergy of cartography and social media with an analysis of how people communicate cartographic elements in social media environments. Furthermore, the analysis examined how this synergetic communication related to user concern for privacy, spatial awareness, and social perspective.

5.1 Defining Social Cartosemiotic Conduct

This study aimed to define SCC, first by examining when social media users are more inclined to share #[location] and emoji in combination; as outlined by Kepes (1967), individuals use cartosemiotic elements (similar to #[location] and emoji) as a way to communicate an inner model of the outer world. Through content analysis data frequency tests and descriptive statistics, this study's findings align with Kepes' (1967) indication, as the majority of SCC social media posts in the sample (48%) were coded as user's sharing their inner model of the outer world. These posts were coded this way because their content showed evidence users wanted to categorize their feelings, appearance, habits, etc. in a manner that embodies the location shared. In other words, these coded posts showed a user need to be associated with the location in the context of their post. This aligns with how Kepes (1967) describes the expression

of cartosemiotics as our experience patterns combined to organize our lives and identity. Goodsell and Seiter (2011), media and communication scholars, share a similar perspective in relation to how social media platforms have become outlets for scrapbooking space and time to communicate and organize spatial information on users' profiles. Furthermore, Gordon (2007) adds, "the act of mapping becomes the means through which the unique systems of family, work and leisure are organized into manageable whole, [or a] spatial organization of everyday life" (p. 898). Therefore, the engagement of SCC, as introduced in the present study's findings, primarily occurs when social media users are expressing their unique models of identity or schema in order to connect to a greater part of the world. Specifically, in a sample of 500 SSC posts, this study showed that 48 percent of Twitter and Instagram users frequently combine #[location] with an emoji to explain their personal connection to their shared place in the post. When combined, #[location] and emoji will more likely display a piece of a social media user's identity associated with their indicated location, rather than displaying physical or literal place geographically.

This SCC study's data frequency tests also showed social media users are likely to combine cartosemiotic elements when modelling/communication spatial knowledge. Specifically, the findings revealed that most social media posts (45%) showed a combination of #[location] and emoji when users presented an objective opinion, review, or expertise of a place defined by their #[location]. This SCC context is the most literal of the three in that a post would show and/or describe a natural or industrial landscape/place and the user would not add any personal identity or subjective perspective to define the post. Literally modelling spatial knowledge in this way is still an act of being a part of something greater, even though the user might not intend for this. Recall, for instance, that mapmakers can be subjective in

portraying location, even though cartographers strive to be as accurate as possible (Garfield, 2013; Van de Woulde, 2008; Pickles, 1995). Mapmakers still make decisions about what shall and shall not be mapped; for example, contemporary maps can "represent unwieldly territories as tidy, governable units and, in so doing, [maps] function as political and ideological tools of empire" (Van der Woude, 2008, p. 1074). Connecting literature on past and present cartographic practices to this study's findings, current social media users can be viewed as mapmakers, or individuals who share map language online, and their cartosemiotics (#[location] + emoji) is a way for them to represent spatial knowledge with a personal agenda to leverage social media presence. Furthermore, the prominence of this modelling spatial knowledge context aligns with the literature on how users want to publicly document the places they have been in order to join those alike, and set themselves apart from those different; specifically, social cartography can:

> Serve as a support to the social interaction processes and participative-action of most distinguished social agents on their way to a gradual reversal of the social alienation or lack of information processes, particularly to processes of political inequality and social and spatial segregation. (Carvalho Di Maio, et. al., 2011, p. 39)

As a dimension of social cartography, SCC presents #[location] and emoji when modelling spatial knowledge in social media in order to further their social interaction, or even remedy social alienation. In other words, according to the majority SCC context in this study's findings, and the literature on social cartography, modelling spatial knowledge through SCC is not always about presenting wayfinding skills; this conduct is for sharing spatial knowledge to increase social processes and identity in social media. Observing the synergy of social media engagement and social cartosemiotics has highlighted how individuals collectively share space and create place together. Turkle (2012) stressed how social media

and technology are promoting a sense of society being alone together, as individuals today primarily spend their time engaging with *virtual* place and people; however, SCC is online engagement that allows people to share and create *real* places. The more individuals share elements of SCC online to communicate space, the more involved society can be as a whole in understanding real, physical places in our world.

Since the descriptive statistics and frequency test results showed that most cases of SCC happen when users were modelling/communicating spatial knowledge, this study complements respective literature on the way that social media users add to the documentation of "change over time or space, enabling audiences to track variations in data through motion—across a map" (Kostelnick, 2016, p. 123). Sharing emoji and #[location] combinations, according to this study's frequency analysis of each SCC context, is a way for social media users (45%) to model their spatial knowledge over time, which mimics what Kostelnick (2016) deems as data visualization of temporal proximity. This study's result on the most prominent SCC context agrees with Kostelnick's (2016) mention of how maps enable audiences to document space/time: by modelling their spatial awareness via SCC. Although the map face may not be literally modelled, the cartosemiotic elements of SCC help social media users visualize and display unique and/or collective spatial knowledge to keep updated presentations of place.

Once descriptive statistics and frequencies were run, the content analysis also showed that people do not typically share SCC to remember or re-vitalize forgotten the past, rather SCC is used to document present places and model current spatial awareness. For instance, very few social media posts in the analyzed sample (6%) implied that users were representing forgotten spatial information. The mere presence of this contexts demonstrates a part of Wolodtschenko's

(2003) understanding of cartosemiotics: “map-language from the standpoint of...re-vitalization of forgotten spatial information” (p. 1977); however, the minimal frequency of this SCC context in the examined social media platforms indicates how users are perhaps more inclined to use a different form of social media communication to indicate their re-vitalization of spatial information. For example, rather than using emoji in combination with #[location], users might use additional hashtags, such as #TBT (throw-back-Thursday), #Memories, #BringItBack, etc., to orient and re-vitalize the past shared location.

After running relationship analyses to test the how the type of emoji category associated with the SCC context it’s shared in, Smileys & People and Animals & Nature were the most commonly used in SCC on Instagram and Twitter. This finding demonstrates the symbolic processes relating to map language in social media; specifically, emoji are contemporarily viewed as signs or symbols that present a meaning-making ability in online communication that transcends cultures and technical lexicon (Danesi, 2017). Social media users’ ability to create and share symbols within online platforms communally changes and adds to map language when combined with some form of sharing location, similar to how sign systems manifest in map faces (Schlichtmann, 2003). Although spatial symbolization, such as emoji in SCC, narrows the scope to audience interpretation for understanding the world (Casti, 2015), this study showed that users’ prominent use of Smileys & People indicates how individuals feel the need to add more emotion, opinion, and reaction through symbols, rather than text, when sharing a location online. For example, in our content analysis open-ended notes, coders observed that when users shared information about an animal in respects to location, such as a pet dog in the Colorado mountains, they were likely to anthropomorphize the animal with Smiley & People emoji. In other similar cases, coders also interpreted that users might be using

this emoji category to input their own emotion, opinion, or reaction to shared location, as their identity was not present in the post (specifically in Instagram posts that did not include people in photos).

Animals & Nature and Symbols were also prominent emoji categories used in SCC on social media, since symbols and map design—or language—is not consistent across assorted platforms (Pikles, 1995; Carter, 2009). Cartographers, or in this case social media users, chose symbols and design they believed best represents the location shared. Wilmott (2016) and Carter (2009) assess a need for accurate and mutually accepted representations of location in cartosemiotics; however, Wilmott (2016) also stresses a need for immediacy of simultaneous movement and representation. He predicts mobile mapping is the answer to this need, as it "engages a divergent set of movement practices, ones that not only respond to the mobile map, but are also reflected in it, on the cartographical interface on the screen" (p. 325). In comparison, this SCC study furthers Wilmott's (2016) progression, by arguing map language, or cartosemiotics, is more potent than mobile mapping in providing simultaneous movement and representation on social media platforms accessible by the public. As the emoji lexicon grows, social media users will have more semiotic variety to communicate location and place online. For now, users have eight categories of emoji to supplement their expression of location. Specifically, choosing certain emoji categories indicates how social media users interpretively map their shared location; for example, this study's descriptive statistics and frequency tests show that the majority of users share Smileys & People and Animals & Nature emoji when combined with a northern Colorado #[location]. These emoji categories, particularly Animals & Nature, could reflect Colorado's iconic wildlife, vast natural areas, and an overall outdoor lifestyle. The purpose of emoji symbols in SCC on social media

platforms aligns with semiotic scholars Riordan (2017), Desani (2017), and Csanvi (1998) who present research that explains how individuals use symbols to provide context, emotion, and to further collaborative discussion of social meaning. Overall, although technology and global knowledge has advanced ancient, hand-drawn cartography, symbols are still a foundational element in cartographic design (Peterson, 2015) and have simultaneously become more prominent in the form of emoji to amend lack of visual cues in CMC, specifically in defining the contexts and characteristics of location and place.

5.2 SCC and User Concern for Privacy

The correlation completed to answer research question three showed that there was a relationship between social media users' concern for privacy and their SCC; confirming hypothesis 1, the more users engage in SCC on social media, the lower their concern for privacy was. The significant correlation is specific to individuals who shared locations representative of northern Colorado, and Liang et. al. (2017) emphasize that "privacy is a culturally specific phenomenon," (p. 1476) and that the permeation of technology in daily lives propels cultural change. Liang et. al.'s (2017) insights indicate that the relationship between concern for privacy and SCC might change when different #[locations] are examined. However, the present study's correlation reveals that re-defining the concept of privacy should be a relevant concern for online communication researchers to examine because it is not a concern for social media users. For instance, after running correlations between variables SCC engagement and concern for privacy, there is an especially low concern for privacy, even when social media users are sharing their locations to public domains. This low concern is because individuals are spending more time building relationships and seeking information in online realms in order to build what now seems to supersede privacy: social capital (Liang, et al., 2017; Choi & Bazarova, 2015). In fact,

previous literature assumed this study's finding, since "having more followers [on social media] indicates higher probability of geo-disclosure" (Liang, et al., 2017, p. 1489) because "users are motivated to self-disclose for building social capital" (Choi & Bazarova, 2015). Based on the evidence from previous literature, in addition to this study's correlation findings that social media users consistently self-report low concern for privacy during SCC, privacy and private information must be re-defined in the realm of social media communication. This provokes the question: *should* privacy be a concern for social media users? Many millennials have created successful identities and earned a profit through building social capital through blogs, vlogs, and other social media profiles (Liang, et al., 2017; Choi & Bazarova, 2015); therefore, is privacy an individual necessity, or is privacy now negotiated among many? Social media profile settings are set by the individual, but they are set in relation to all who can view the individual's information. Observing and analyzing how and when users share #[location] and emoji on social media has indicated an idea of collective privacy, in which an individual has low concern for privacy in order to reach other users who share #[locations] similarly; however, an entire group of users who share #FortCollins, for example, might have a collective privacy indicative of that shared location. As users build social capital by sharing location and emoji/pictures online, SCC is furthering map language online, which accumulates a social understanding of place and location and fulfills the need for immediate social/mobile mapping (Wilmott, 2016). Perhaps lack of individual privacy is a small price to pay in the grand scheme of social capital and social mapping. Comparably, Jia and Xu (2016) advance that "there is an increasing concern over information privacy beyond the individual perspective, however limited research has empirically examined if individuals are concerned about privacy loss not only of their own but their social ties'" (p. 1). These two scholars developed and validated a scale instrument that measures

collective privacy concern on social networking sites (CPCSNS) because "the notion of privacy through the individual lens is insufficient to capture the entire scope of privacy issues (Jia & Xu, p. 2). Since this SCC study found low concern for privacy at the individual level, future research on SCC should implement the CPCSNS scale to better determine concern for privacy at a group level in relation to social cartosemiotic engagement.

5.3 SCC and User Spatial Awareness: Research Question 6

Although the relationship between user spatial awareness and SCC was not statistically significant, this result still offers implications, particularly in comparison to how SCC and #[locations] were observed when users modelled spatial knowledge in this study's content analysis. The following discussion answers RQ6: Are there commonalities between the descriptive data of SCC and how users self-report this conduct?

Spatial awareness was not prominently influenced by SCC, but was more influenced by subjective and personal characteristics like concern for privacy and social perspective were significantly related to SCC. Similarly, in the content analysis findings, social media users did share within the context of modelling/communicating spatial knowledge; however, they did so in order to promote social interactions or remedy social alienation (Carvalho Di Maio, et. al., 2011). This shows a commonality between the findings of the survey and content analysis studies: modelling spatial knowledge and developing spatial awareness is not the underlying purpose of sharing map language or communicating location online; rather, this cartosemiotic conduct is for sharing spatial information or opinion as a way to increase social processes and relationships in social media. As previously discussed, literature in cartography and geography presents how participatory mapping and social cartography can influence respective users' perceptions and behaviors (Pickles, 1995; Pavlovskaya, 2016; Lin, 2013; Van der Woude,

2008; Garfield, 2013; Wood, Kaiser, & Abramms, 2001; Monmonier, 1991); however, these perceptions and behaviors might not have been spatial related, or encompassed in wayfinding skills. Instead, this study's finding showed a lack of correlation between spatial awareness and SCC, indicating that social media users' perceptions and behaviors are more related to social perspectives and concern for privacy during SCC.

5.4 Social Perspective

Elements in maps present viewers' surroundings, exuding hegemony that influences how a world or culture should be understood, which affects societal perceptions and how one interacted/interpreted their surroundings (Garfield, 2013; Van de Woulde, 2008; Pickles, 1995). Comparably, the current study's correlation results showed that the more social media users shared emoji (a cartosemiotic element), the higher their social perspective was likely to be. This finding aligns with the literature in how social perspective significantly relates to elements of map language on social media through SCC. Sharing emoji, or an SCC element, positively influences societal perceptions, which in turn influences how others on social media understand a place or location. In a way, the emoji lexicon is an apparatus for a social media user, similar to how a map legend is an apparatus for a cartographer; this is because emoji are contemporarily viewed as signs or symbols that present a meaning-making ability in online communication that transcends cultures and technical lexicon to represent a location (Danesi, 2017).

5.4.1 Social Perspective and Research Question 6

#[location], another SCC element, shares a significant relationship with social media users' self-awareness. This is a category of social perspective, or what Morais and Ogden (2010) call Global Competence. This study's findings show that the more social media users'

share #[location], the higher their self-awareness. This positive correlation also informs the answer to RQ6, as it shows another commonality between the descriptive and analytical data. The content analysis showed that social media users partaking in SCC are most likely to share their location and emoji in a context that shares their inner model of the outer world. This is similar to the survey data that showed a positive relationship between sharing #[location] and a users' self- awareness. Combined, these self-reported and observed results of SCC confirm that a social media user who shares location online is usually presenting a personal connection or representation to such #[location] shared. This is because "they do not want to know the world and to reflect on it; they want to invent it, manipulate it" (Carter, 2009, p. xiii). Furthermore, humans interact with and add to the world by using "symbolic tools, or signs, to mediate and regulate relationships with...[them]selves" (Lantolf, 2000, p. 1). This semiotic engagement can be specified in cartosemiotic elements like #[location] and emoji that individuals can implement in social media spaces to communicate their understanding of the world (or place) and where they exist in that space.

5.5 Limitations

The primary limitation of this study was that the survey data was not directly comparable to the content analysis data, since there was no way to determine overlap in the survey respondents and the users contributing the social media posts that were randomly collected for the content analysis. Although this was a limitation, analyzing and discussion the similarities between the data from each method was sufficient in exploring the newly defined of SCC. The other two main drawbacks of this study were the limited social media platform exploration in the content analysis, and the limited respondents from a convenience sample that was ungeneralizable and restricted to a specific age group. All respondents were controlled between

the ages of 18-23, which distinguishes privacy characteristics that may not be similar in earlier or later generations. This study showed that Millennials have low concern for privacy; however, this likely may not be the case for older generations, such as the baby boomers, who are also currently active on social media. According to Pew Research (2018), Twitter and Instagram users represent a smaller subset of the US population, as 25% of adults in the US are on Twitter and 35% are on Instagram. These statistics indicate that Twitter and Instagram were adequate platforms to analyze specific online engagement; however, these platforms (specifically Twitter) might not have been the most relevant social media sites to analyze my target population of millennial generation users. Although, Twitter was the most accessible platform for data collection, and, in combination with Instagram, the content analysis results still showed great promise for extrapolated SCC research.

Another limitation was how hashtags can be coarse in what they represent or communicate, meaning that what they define or categorize can be highly subjective with no definite boundaries. While coding, for example, there were a few instances where #foco was used as a hashtag meaning "focus" in Spanish, and #boulder was also shared to indicate the specific rock climbing sport, which was common in Northern Colorado references. These hashtags had to be controlled for in the content analysis, so they were manually filtered from the systematically collected sample once spotted. This need to control for hashtag representations shows the subjectivity of hashtags as a limitation to objective coding. Even though this was controlled for through pilot testing and established interrater reliability with multiple coders (Laerd Statistics, 2013; Lombard, et. al., 2010), it is still a limitation to consider in future studies examining hashtags. Furthermore, the examination of emoji categories, rather than individual emoji symbols, was slightly constraining when analyzing the types of symbols used in SCC; the

emoji categories are not always indicative of the individual emoji meanings. This study generalized each emoji to their category; however, users interpret and share emoji in ways that extend beyond their categorical meaning. For example, both a smiley face emoji and a thumbs-down emoji are in the same category Smileys & People, but have differing individual meanings that were not analyzed in depth for this study. In addition, as another example, a textual message or post that is accompanied by a clapping hands emoji could clarify a celebratory tone or sarcastic tone. Consequently, for future SCC or emoji research, emoji should not strictly be examined as literal symbols.

Overall, in order to control for foreseen limitations that both methods share in reliability and validity, pilot and pretests were conducted and re-conducted when necessary to test both instruments (questionnaire and coding scheme), and strong intercoder reliability was confirmed via Cohen's Kappa in order to eliminate any subjective decision making when following the coding scheme.

5.6 Recommendations for Research and Practice

In relation to the resolving the explained limitations of this study, future studies examining SCC are encouraged to collect more accurate and generalizable data. For example, conducting a similar content analysis with different #[locations] would be ideal, or a larger survey sample of social media users collected via random sampling and vigorous recruitment methods to increase response rate. Also, examining specific emoji categories in depth, rather than a generalization to the entire lexicon could control for more 'map-face-like symbols' to be scrutinized in social media; for example, if the content analysis only searched for #[locations] shared with Objects and Symbols emoji, this might display social symbols that were more like map/cartographic symbols and less emotional/interpretive. Analyzing

platforms other than Instagram and Twitter would also be beneficial in continuing SCC research, especially since social media users are not prominently using Twitter compared to others such as Snap Chat (Pew Research, 2018). SnapChat would be an ideal platform to examine in a replicated study, including a SnapMap engagement analysis and how users interact with the map itself in social media environments, rather than solely map language in posts. Although Twitter might not have been the best platform for the content analysis, it allowed for filtering specific posts that had accurate SCC, whereas SnapChat is not as easily navigable for data collection.

Since this study's findings indicate that sharing #[location] was not as grounded in spatial awareness and modelling spatial knowledge as hypothesized, researching the relationship between #[location] sharing and their corresponding geographic coordinates would be an interesting lens. To what degree are spatial boundaries associated with #[locations]? Are they only used as categorical stamps that share association with locations and subjective underlying tones? If these geo-hashtags are related in some way to geography, a physical/visual map portraying SCC could be an interesting development in social cartography. The creation of this SCC map could indicate the most prominently shared emoji presented as a symbol for the coordinates that the shared #[location] represents.

In addition to this objective look of SCC elements, a qualitative content analysis or social media focus group would be appropriate to interpret the reasoning behind users' choice in emoji in combination with #[location]. For example, on Instagram, when posts that included animals were coded, the corresponding emoji was almost always from Smileys & People. Was this to give the pet human emotion/expression? Is the sharing of Smileys & People emoji the user's way of placing themselves in a place/location/situation when they are not in the picture

being shared? Evaluating these motives behind sharing specific emoji categories will better inform *why* social media users communicate SCC elements in different cartosemiotic contexts.

From a practical perspective, evaluating these contexts of SCC could be helpful for marketing companies looking for geographic—or in this case, cartographic— data to rely on defining target consumer markets. For example, "Animals & Nature" and "Activity & Sport" are some of the emoji categories used across #[locations] of northern Colorado. This observation confirms the characteristics of Coloradoans' healthy and active lifestyle. Examining the use of specific #[locations] with emoji under different contexts would inform specific elements of creative content needed to deliver, reflect, or advertise a message. SCC could also have practical applications in new cartographic and geographic practices; for example, if social media users are sharing space and creating place online with geo-hashtags and emoji symbols, then they are communicating individually motivated and designed landscapes. Therefore, would an amass of emoji distinguish certain geographic areas? If so, SCC data could influence future mapping practices focusing on *emojiscaping*, rather than landscaping, in which space would be X-Y coordinates and place would be crafted by layers of the shared emoji symbols within those coordinates. *Emojiscaping* could be an innovative addition to mapathons that help communicate vulnerable or developing places in the world "so that local and international NGO's can use these maps and data to better respond to crises" (Missing Maps, 2017) or better understand and communicate unfamiliar places. For example, numerous individuals affected by Hurricane Harvey turned to social media platforms to share their location and condition in real-time in order to keep open communication among their families, friends, community, and first responders (Rhodan, 2017; Seetharaman & Wells, 2017; Silverman, 2017; Hempel; 2017). Analyzing this particular SCC could be fundamental in

shaping how we can effectively map places using social media elements, like emoji, to communicate events like this natural disaster.

5.7 Conclusion

Lammes (2017) intellectually concludes that "cartographical interfaces invite users to a higher or lesser degree to give input that changes the map image and puts users in the map (p. 1029); similarly, this SCC study extrapolates that cartographical interfaces, particularly ones provided by social media features, invite people to give input that changes map *language* and puts social media users at the forefront of this vernacular. SCC, or map language on social media, is another way for individuals to express social identity, self- awareness, and spatial perspective. Sharing location information online is also a more collaborative form of communicating place and space in online environments in order to build social capital, which is drastically sought out by social media users. At the expense of diminishing concern for privacy, sharing map language builds social capital and increases communication in online realms through #[locations] and emoji use. This cartosemiotic process of choosing emoji categories to subjectively represent location shows a potential feedback loop from objective, technological cartographic practices, back to ancient map practices. Like ancient mapmakers, social media users present the power not only to communicate *to* the world, but communicate the world itself.

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APPENDIX A: CODING SCHEME

Social Cartosemiotic Conduct Coding Scheme
Revised Jan. 7th, 2018

Definition
Social Cartosemiotic Conduct = social media posts that display content including a geotag(s) and emoji(s).

Coding
For each Tweet or Instagram post, do the following:

- Indicate what **geotag** is shared
- Indicate what **emoji category** is shared
- Indicate what **context** the post reflects

Rules for determining the elements specific to the posts and tweets
To determine the Geotag, Emoji Category, and Context of the posts and tweets, use the following visual determinations.

Geotags

- #fortcollins
- #boulder
- #denver
- #foco
- #milehighcity
- #ColoradoSprings
- #Colosprings

Note: Since this study looks at hashtags as categorical stamps that indicate location, please do not code a location that is mentioned not in the form of a hashtag (i.e. part of the post/tweet message outside the added hashtags).

Emoji Category

- Smileys & People
- Animals & Nature
- Food & Drink
- Activity & Sport
- Travel & Places
- Objects
- Symbols
- Flags

Note: If you are unsure of what category a specific emoji fits, use an emoji lexicon website, or even your own mobile emoji keyboard, as a reference.
https://unicode.org/emoji/charts/full-emoji-list.html

Note: If there are more than one emoji in a post or tweet, only code the emoji category; therefore, if a post or tweet includes a sad smiley and a woman emoji, only the Smileys & People category would be coded once. If multiple categories are used (1-8), code those differing categories; for example, if a post or tweet includes a dog emoji, and soccer ball emoji, both Animals & Nature and Activity & Sport would be coded.

Context
This can be interpreted from the post or tweet as a whole, not just solely on the pairing of the geotag(s) and emoji(s).

- Model/communicate spatial knowledge
    - User shares opinion, review, advertisement, or expertise of or in a place
    - Set in the present or future
- Re-vitalize forgotten spatial information
    - Users remind public and/or themselves of a place or element of a place
    - Hashtags or content that indicates "Throwback" or #tbt (set in past)
    - Any content with an element or sense of remembering a place
- Shares user's inner model of the outer world
    - Presenting a piece of themselves or their lives in respect to a greater whole.
    - Example: User includes #fortcollins and that their part of the whole is as a student at Colorado State University
    - Example: User includes #denver and portrays that their vegetarianism and fitness regime is indicative of the city/state they reside in, or comparative to other cities/states/countries/cultures.
    - Example: User includes #denver to portray place representative of their sport team (hashtag is more than a place, it's a team/tradition)
    - Example: Users add the geotag as an outer model of their inner self, AKA a characteristic/identifier—a selfie with a vague caption and a geotag.

Note: if it appears there is more than one context in a tweet or post, pick the most dominant context.

Coding Example:

Instagram Post	**Geotag**	**Emoji Category**	**Context**
27	#fortcollins	Food & Drink	Model...
28	#denver #colorado	Object Travel & Places	Re-Vitalize...

Tweet	**Geotag**	**Emoji Category**	**Context**
27	#boulder	Flags	Model...
28	#fortcollins #foco	Smileys & People Animals & Nature	Shares...

Lottery Survey: Social Cartosemiotic Conduct

Start of Block: Consent

Intro Thank you for your interest in taking this survey!

Should you be eligible to complete this survey, there will be a link for you to click and enter your name for the chance to win 1 of 5 Amazon gift cards in the amount of $10 as a token of appreciation. The survey will only take about 8-10 minutes of your time, and your answers will help further research in social media communication and mapping technology.

Take the survey only once. Duplicate entries into the gift card drawing will be deleted.

This survey is 100% voluntary and confidential, so you may choose to close this survey at any time if you do not wish to continue and you may skip any question you do not wish to answer. If you do decide to complete this survey, your name and personal identifiers will not be attached to your answers, and your name entered in the lottery draw will not be attached to your survey answers.

If you DO NOT wish to be a survey participant, close your browser to exit the survey.

Otherwise, please indicate below that you consent to participate after reading the above information, and understand your rights as a survey participant. Remember, look for the link at the end of the survey to enter your name for the lottery draw.

If you have any questions about the research, please contact Paige Odegard at paige.odegard@colostate.edu. If you have any questions about your rights as a volunteer in this research, contact the CSU Institutional Review Board at: RICRO_IRB@mail.colostate.edu; 970-491-1553.

○ I have read and understand the above information. I consent to being a survey participant.

End of Block: Consent

Start of Block: Screening

Age Using only numbers, please type in your age below.

_____

Skip To: End of Survey If Using only numbers, please type in your age below. >= 25

Skip To: End of Survey If Using only numbers, please type in your age below. <= 17

How often do you post or comment on social media?
Social media includes platforms like, but not limited to, Twitter, Instagram, Facebook, and SnapChat.

- ○ Always
- ○ Most of the time
- ○ Sometimes
- ○ Rarely
- ○ Never

Display This Question:

If Screen_Posting = Never

How often do you message people using social media?
This includes, but is not limited to, using Facebook Messenger, SnapChat Messaging, direct messaging on Instgram and Twitter, or SMS Messenger/iMessage.

- Always
- Most of the time
- Sometimes
- Rarely
- Never

End of Block: Screening

Start of Block: Transition

Display This Question:

If Screen_Messaging = Never

X→

Void You have indicated that you NEVER post or message via social media. Is this true?

- True - I NEVER post or message via social media.
- False - I DO post and/or message via social media.

Skip To: End of Survey If Void = True - I NEVER post or message via social media.

End of Block: Transition

Start of Block: ScreeningX2

Display This Question:

If Void = False - I DO post and/or message via social media.

How often do you post or comment on social media?
Social media includes platforms like, but not limited to, Twitter, Instagram, Facebook, and SnapChat.

- Always
- Most of the time
- Sometimes
- Rarely
- Never

Display This Question:

If ScreenX2_Posting = Never

How often do you message people using social media?
This includes, but is not limited to, using Facebook Messenger, SnapChat Messaging, or SMS Messenger/iMessage.

- Always
- Most of the time
- Sometimes
- Rarely
- Never

Skip To: End of Survey If ScreenX2_Messaging = Never

End of Block: ScreeningX2

Start of Block: SCC

In the past month, about how much of your social media communication includes at least one location hashtag (#[location])?

Examples of location hashtags include, **but are not limited to**: #FortCollins, #CSU, #FoCo, #Denver, #Boulder, #Colosprings, #OldTown, #Downtown, #Colorado, #USA
This includes, but is not limited to, using Facebook, Facebook Messenger, SnapChat, Instgram, Twitter, or SMS Messenger/iMessage.

- ○ All of my social media communication
- ○ Most of my social media communication
- ○ Some of my social media communication
- ○ Few of my social media communication
- ○ None of my social media communication

In the past month, about how much of your social media communication includes at least one emoji?

This includes, but is not limited to, using Facebook, Facebook Messenger, SnapChat, Instgram, Twitter, or SMS Messenger/iMessage.

- ○ All of my social media communication
- ○ Most of my social media communication
- ○ Some of my social media communication
- ○ Few of my social media communication
- ○ None of my social media communication

In the past month, about how much of your social media communication includes both an emoji **and** #[location]?

This includes, but is not limited to, using Facebook, Facebook Messenger, SnapChat, Instgram, Twitter, or SMS Messenger/iMessage.

- ○ All of my social media communication
- ○ Most of my social media communication
- ○ Some of my social media communication
- ○ Few of my social media communication
- ○ None of my social media communication

What do you usually consider sharing on each social media platform?
Please check all that apply below to indicate your usual engagement with each social media platform.

	#[location]	Add/share my location	GeoFilters	Emoji	Bitmoji	Picture	Gif
Twitter	☐	☐	☐	☐	☐	☐	☐
Instagram	☐	☐	☐	☐	☐	☐	☐
Facebook	☐	☐	☐	☐	☐	☐	☐
SMS Messenger / iMessage	☐	☐	☐	☐	☐	☐	☐
SnapChat	☐	☐	☐	☐	☐	☐	☐

End of Block: SCC

Start of Block: Spatial Awareness

Do you or have you ever lived in or within 20 miles of Fort Collins, even if only for school?

- ○ Yes, in Fort Collins.
- ○ Yes, outside of Fort Collins but within 20 miles.
- ○ No

Display This Question:

If SpA_inFoCo = Yes, in Fort Collins.

Or SpA_inFoCo = Yes, outside of Fort Collins but within 20 miles.

In total, how long have you lived in Fort Collins or within 20 miles of Fort Collins? Your best guess is fine.
Please enter a number in each box to indicate number of years and months

- ○ Years _____
- ○ Months _____

How long have you gone to school at Colorado State University? Your best guess is fine.
Please enter a number in each box to indicate number of years and months

- ○ Years _____
- ○ Months _____

Thinking about your own habits, to what degree do you agree or disagree with the following statements?

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
When I travel around Fort Collins, I prefer to use memorable landmarks to navigate, rather than a map.	○	○	○	○	○	○	○
I tend to notice unique buildings or landmarks in a new place before most people do.	○	○	○	○	○	○	○
While driving, biking, walking, or running around Fort Collins, I always notice obstacles in my path in advance.	○	○	○	○	○	○	○

Thinking about your own habits, to what degree do you agree or disagree with the following statements?

	Strongly Agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
I am confident traveling to an unfamiliar place without consulting a GPS.	○	○	○	○	○	○	○
I am confident in my ability to communicate directions to someone in Fort Collins.	○	○	○	○	○	○	○
I believe I am fully aware of most objects (i.e. buildings, roads, landmarks, etc.) in my Fort Collins surroundings.	○	○	○	○	○	○	○

Thinking about your own habits, to what degree do you agree or disagree with the following statements?

	Strongly Agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
If I use a GPS to travel to an unfamiliar place, I am confident in re-tracing my steps without using a GPS.	○	○	○	○	○	○	○
If I use a GPS to travel to an unfamiliar place, I will not have to use the GPS to travel there again in the future.	○	○	○	○	○	○	○
I am confident traveling to familiar places without consulting a GPS.	○	○	○	○	○	○	○

End of Block: Spatial Awareness

Start of Block: Social Perspective

Thinking about your own habits, to what degree do you agree or disagree with the following statements?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I am confident that I can thrive in any culture or country.	○	○	○	○	○
I know how to help solve a global environment or social problem.	○	○	○	○	○
I know several ways in which I can make a difference on what I consider some of this world's most worrisome problems.	○	○	○	○	○
I am able to get other people to care about global problems that concern me.	○	○	○	○	○

Thinking about your own habits, to what degree do you agree or disagree with the following statements?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I unconsciously adapt my behavior and mannerisms when I am interacting with people of other cultures.	○	○	○	○	○
I often adapt my communication style to other people's cultural background.	○	○	○	○	○
I am able to communicate in different ways with people from different cultures.	○	○	○	○	○
I am fluent in more than one language.	○	○	○	○	○
I welcome working with people who have different cultural values from me.	○	○	○	○	○

I am able to mediate interactions between people of different cultures by helping them understand each other's values and practices.	○	○	○	○	○

Thinking about your own habits, to what degree do you agree or disagree with the following statements?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I am informed of current issues that impact international relationships.	○	○	○	○	○
I feel comfortable expressing my views regarding a pressing global problem in front of a group of people.	○	○	○	○	○
I am able to write an opinion letter to a local media source expressing my concerns over global inequalities and issues.	○	○	○	○	○

End of Block: Social Perspective

Start of Block: Concern for Privacy

Thinking about your own habits, to what degree do you agree or disagree with the following statements?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I usually share my location or hashtag a location on social media **before** I go to that location.	○	○	○	○	○
I usually share my location or hashtag a location **while** I am at that location.	○	○	○	○	○
I usually share my location or hashtag a location **after** I have left that location.	○	○	○	○	○

Here are some statements about personal information. From the standpoint of personal privacy in online environments, to what extent do you, as an individual, agree or disagree with each statement?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
It usually bothers me when social media platforms ask me for personal information.	○	○	○	○	○
When social media platforms ask me for personal information, I sometimes think twice before providing it.	○	○	○	○	○
It bothers me to give personal information to so many people through social media.	○	○	○	○	○
It bothers me to give personal information to so many people in offline/real environments.	○	○	○	○	○

Here are some statements about personal information. From the standpoint of personal privacy in online environments, to what extent do you, as an individual, agree or disagree with each statement?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I am concerned that social media companies are collecting too much personal information about me.	○	○	○	○	○
Social media companies should devote more time and effort to preventing unauthorized access to personal information.	○	○	○	○	○
Social media companies should take more steps to make sure that the personal information in their databases is accurate.	○	○	○	○	○
Social media companies should have better procedures to protect personal information	○	○	○	○	○

Social media companies should devote more time and effort to verifying the accuracy of my personal information in their databases.	○	○	○	○	○

Here are some statements about personal information. From the standpoint of personal privacy in online environments, to what extent do you, as an individual, agree or disagree with each statement?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Social media companies should not use personal information for any purposes unless it has been authorized by the individual who shared the information.	○	○	○	○	○
When people share personal information on social media, the social media company should never use the information for any other purpose.	○	○	○	○	○
Social media companies should never sell the personal information in their computer databases to other companies.	○	○	○	○	○

Social media companies should never share personal information with other companies unless it has been authorized by the individual who shared the information.	○	○	○	○	○

Here are some statements about personal information. From the standpoint of personal privacy in online environments, to what extent do you, as an individual, agree or disagree with each statement?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Social media are a real threat to privacy in this country.	○	○	○	○	○
Sometimes I am afraid that social media platforms will lose/erase information on my profile.	○	○	○	○	○
I am easily frustrated by social media platforms suggesting I share my personal information.	○	○	○	○	○
I am sometimes frustrated by the increasing amount of social pressure to share my personal information on social media.	○	○	○	○	○

In the next three years, how likely are you to do the following?

	Extremely likely	Somewhat likely	Neither likely nor unlikely	Somewhat unlikely	Extremely unlikely
Decide not to download an app or social media feature because you do not want to provide certain kinds of information about yourself.	○	○	○	○	○
Refuse to share information on social media because you think it is too personal.	○	○	○	○	○
Take action to have your profile removed from social media platform.	○	○	○	○	○
Take action to have your name changed on a social media profile.	○	○	○	○	○
Refuse to create a profile on social media platform because you disagree with the way it uses personal information.	○	○	○	○	○

End of Block: Concern for Privacy

Start of Block: Demographics

Major What is your major?

_____

Gender What gender do you most identify as?

- ○ Female
- ○ Male
- ○ Transgender Female
- ○ Transgender Male
- ○ Not Listed - Please Specify: _____
- ○ Prefer not to answer

Ethnicity Which ethnicity best describes you? If needed, please select all that apply.

- ☐ White
- ☐ Hispanic or Latino
- ☐ Black or African American
- ☐ Asian
- ☐ American Indian or Alaska Native
- ☐ Native Hawaiian or Pacific Islander
- ☐ Not Listed - Please Specify: _____

End of Block: Demographics

Start of Block: Block 9

Lottery **LOTTERY DRAW**

Thank you for taking the time to complete this survey! **Congratulations**, you can enter to win one of five $10 Amazon gift cards. Just **click the link below** to enter your name for the lottery:

http://colostate.az1.qualtrics.com/jfe/form/SV_9vsACQexkhZ8wSx

** This lottery link is on a separate page, so your entered information will be confidential and not attached to your survey answers **

After submitting your name and email through the link, you may close this page/browser. You do not need to click the next button.

End of Block: Block 9