Journal of Cultural Geography

Mapping narratives: the 1992 Los Angeles riots as a case study for narrative-based geovisualization

Paul R. Watts [a]

[a] Department of Geography and Anthropology,
Louisiana State University, USA

Available online: 08 Jul 2010

PLEASE SCROLL DOWN FOR ARTICLE

whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Mapping narratives: the 1992 Los Angeles riots as a case study for narrative-based geovisualization

Paul R. Watts*

Department of Geography and Anthropology, Louisiana State University, USA

In this paper, I demonstrate that narrative-based geovisualization contributes to a broader understanding of complex social and inherently spatial phenomena, such as riots, when combined with other data. Past spatial scholarship on riots has analyzed point-distribution data representing damaged structures caused by fires and vandalism. Although this approach is insightful, the analysis of damaged structures engages with just one type of many other significant occurrences during a riot. Since riots are a result of human actions, I am interested in representing other significant occurrences through the eyewitness, on-the-ground accounts—or narratives—that reveal individual observations and experiences. Using the 1992 Los Angeles riots as a case study, I combine point-distribution data and narrative data as a complementary, multiple-methods approach to investigate human actions during riots.

Keywords: narrative; geovisualization; qualitative data; multiple-methods; riots; Los Angeles

Introduction

On 29 April 1992, from Simi Valley, California, the media broadcasted a jury's not-guilty verdicts of the four Los Angeles Police Department (LAPD) officers on trial for beating Rodney King. What followed was nearly three days of riots in Los Angeles resulting in at least 42 deaths, more than 700 businesses burned, over 4,300 firearms looted from retail stores, 5,002 people arrested, and approximately one billion dollars in property damage (Webster and Williams 1992a).

In this paper, I demonstrate that the geovisualization[1] of narrative data can lead to a different understanding of complex social and inherently spatial phenomena, such as riots, than quantitative data alone. I begin by covering the relevant literature on riots in Los Angeles, followed by scholars' quantitative spatial analyses using variables such as fatalities, structural fires, and vandalism to examine the 1992 Los Angeles riots. After a brief discussion of my own point-distribution map showing

*Paul R. Watts is a Ph.D. candidate at the Department of Geography and Anthropology, Louisiana State University, Baton Rouge, LA, USA. Email: pwatts1@lsu.edu

the riots' damaged structures, I advocate for combining complementary narrative data to represent other significant occurrences during the riots in addition to destruction. I then give a brief overview of work by geographers that have combined qualitative-based data with geographic information systems (GIS) and other mapping techniques. As a way to map qualitative data, I present three case studies, each using narratives to represent observations and experiences during the 1992 Los Angeles riots. I close with a discussion on the limitations and challenges I encountered while mapping narratives for this paper.

Riots in Los Angeles

Los Angeles (Figure 1) has endured two destructive riots: the Watts riots in 1965 and the 1992 Los Angeles riots.[2] Both riots had multiple fatalities, hundreds of injuries, and widespread property damage extending over dozens of square miles. Following the Watts riots, then Governor Edmund G. Brown appointed a commission of "distinguished Californians" to produce a riot chronology, investigate the causes, and "develop recommendations for action designed to prevent a recurrence of these tragic disorders" (Brown, quoted in McCone 1965, pgs. i, iii, respectively), which drew criticism (see Fogelson 1969). Scholarly work on the Watts riots primarily examined the socioeconomic conditions of Los Angeles's black underclass (Cohen 1970; Sears and McConahay 1973). Additional work includes Horne's (1995) general overview, Crump's (1966) pictorial
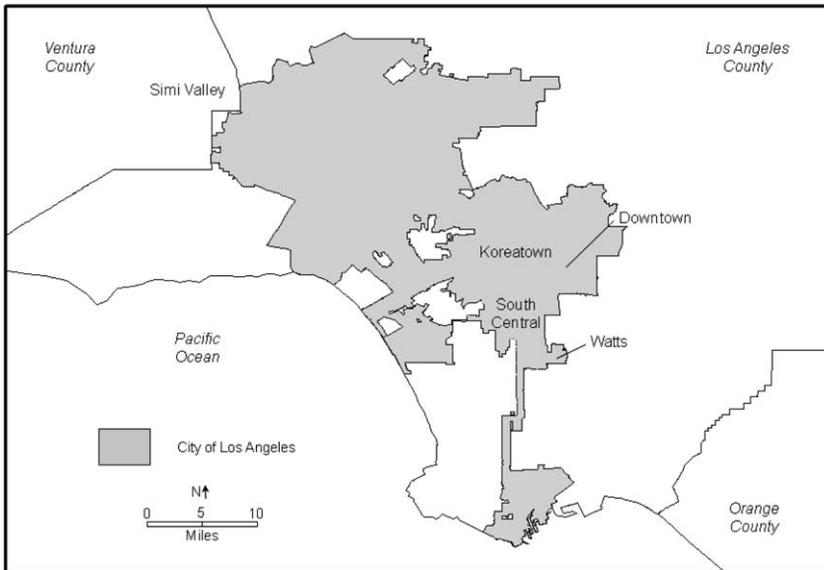

Figure 1.   Los Angeles and surrounding counties.

chronology, and Canot's (1967) compilations of government documents, personal interviews, and on-the-street observations.

For the 1992 Los Angeles riots, officials working with the City of Los Angeles produced a comprehensive, two-volume overview, including a chronology of events, responses by law enforcement, and structural damage and arrest analysis (Webster and Williams 1992a, 1992b). Academic work in edited collections represents a range of scholars from the humanities and social sciences (Gooding-Williams 1993; Baldassare 1994). Researchers from the University of California, Los Angeles (UCLA) Center for the Study of Urban Poverty investigated the social and economic conditions in South Central Los Angeles (Johnson *et al.* 1992), and evaluated post-riot policy responses (Jackson *et al.* 1993). The Rand Corporation published two papers analyzing the demographic characteristics of Los Angeles and of those arrested during the riots (Morrison and Lowry 1993; Petersilia and Abrahamse 1996, respectively). Hutchings (1997) compiled a detailed chronology of the LAPD's responses to the riots in order to assess performance and make recommendations. Hunt (1997) examined the television news media and its depiction of racial identities during the riots. Cannon (1997) dedicated several chapters on the beating of motorist Rodney King, the subsequent trial, and the jury's not-guilty verdicts that led to the riots. Essays by journalists and independent writers covered an array of topics such as, but not limited to, underlying causes, political commentary, and eyewitness accounts, (Coffey 1992; Hazen 1992; James 2002; Tervalon 2002).

Mapping the 1992 Los Angeles riots

Staff from the *Los Angeles Times* mapped structure fires for Los Angeles County (Young 1992) as well as structure fires and fatalities for the areas around South Central (Meyers *et al.* 1992). Researchers at the Rose Institute of State and Local Government (1992a, 1992b) produced a series of thematic maps showing socioeconomic/demographic data at the census-tract level accompanied with acetate overlays that plotted fires and looting. Others have mapped the riots' flash points in relation to neighborhood ethnicity and areas of poverty (Jencks 1993), conducted hot spot analysis of both the 1965 and 1992 riots to map an epicenter of fear (Matei and Ball-Rokeach 2005), and used satellite imagery to measure and depict a thermal anomaly from the fires (Dousset *et al.* 1993).

According to geographer Michael Ridland (1993), on 5 June 1992, the Los Angeles Department of Building and Public Safety, in conjunction with the Los Angeles City Fire Department, published the Civil Disorder Damage Survey (CDDS). The CDDS (1992) contains addresses where commercial and residential structures were set ablaze or vandalized during the 1992 Los Angeles riots. Ridland (1993) used GIS to map fire and vandalism data from the CDDS (1992) for his spatial analysis of

riot-damaged structures within South Central Los Angeles. He presents two hypotheses: first, that riot damage is not random but linear along commercial corridors; and, second, that riot damage correlates with nine selected socioeconomic variables including income, poverty, and over-crowding (Ridland 1993). Analysis of his data confirm the first hypothesis: riot damage is not random. As Ridland states, "the riot damage does appear to follow a pattern," but what type of pattern still remains unclear (1993, p. 59). The CDDS data, however, did not confirm the second hypothesis, showing instead that riot damage is neither correlated with, nor can be predicted by, the nine socioeconomic variables, leading Ridland to conclude, "These hypotheses appear to be extremely poor predictors of riot damage of any type" (1993, p. 67).

Sociologists Albert Bergesen and Max Herman (1998) argue that rapid in-migration by Asians and Hispanics into Los Angeles neighborhoods with an established African-American majority, what the authors refer to as "hyper-ethnic succession," led to a greater propensity for violence during the 1992 riots (1998, p. 41). Their work mapped the locations of riot variables with demographic data to show that census tracts with at least 40 percent Hispanic and 40 percent African-American residents sustained a greater number of both fatalities and damaged structures than did less diverse or even segregated census tracts (Bergesen and Herman 1998). Rioting "occurs in areas of mixed racial/ethnic composition," according to Bergesen and Herman (1998, p. 45), not in areas of segregation—an important finding because it suggests a multiethnic complexity.

By using GIS as a tool for data analysis, Ridland (1993) and Bergesen and Herman (1998) have added a much-needed spatial component to an already robust body of scholarship in the social sciences that has quantitatively examined the underlying causes of riots (see, for example, Spilerman 1970, 1971; Adams 1972; Olzak and Shanahan 1996, and Olzak *et al.* 1996). In my earlier attempt to study the 1992 Los Angeles riots, I obtained a paper copy of the CDDS (1992) in 1998, which contained 1,095 addresses. I then combined addresses from the CDDS with an additional data set by Ong and Hee (1993) for a total of 1,234 mappable locations. From the United States Census Bureau website, I downloaded 1990 Census-tract demographic data[3] and GIS shapefiles[4] for Los Angeles County, which I imported into the GIS software, ArcView 3.2. Using GIS, I created a point-distribution map identifying the locations of riot-damaged structures (Figure 2).

As Figure 2 shows, damaged structures during the 1992 riots were widespread and affected many neighborhoods in Los Angeles, a city of 469.3 square miles.[5] However, additional types of riot data exist that would complement the locations of damaged structures presented in Figure 2, including the destruction of automobiles and other types of
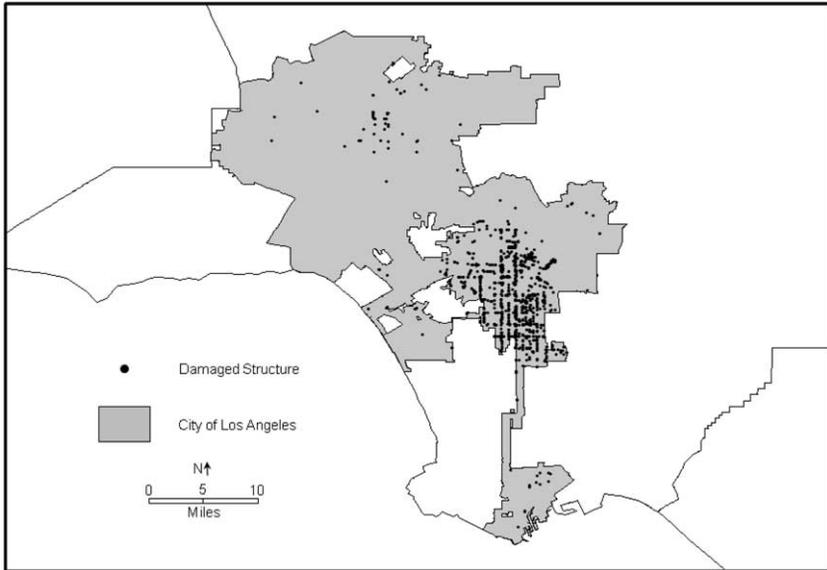
Figure 2. Damaged structures during the 1992 Los Angeles riots.

situations such as violence against people. As examples, a *Los Angeles Times* photographer, Rosemary Kaul, captured an image of a Monte Carlo's burnt-out shell located at the intersection of Florence and Normandie Avenues, "serving as a silent testimony to the terror some motorists experienced during the early stages of the unrest" (quoted in Coffey 1992, p. 104). This is the same intersection where a group of young men pulled truck driver Reginald Denny from the cab of his vehicle and beat him unconscious (Cannon 1997). The Monte Carlo and Reginald Denny represent significant occurrences that can also be mapped, just as geographers and other scholars have mapped the locations of riot damage.

Past scholarship has relied primarily upon the analysis of physical evidence, such as damaged structures, which is the most visible and immediate indicator of a riot's destruction. Destruction is then a means to measure, a means to understand what happened during a riot, yet it only tells one part of the story. By only mapping a riot's destruction, this one part of the story is told and presumed to be complete. But destruction is a byproduct within a complex social and inherently spatial phenomena resulting from human actions—and these human actions also tell a story.

In this paper, I have mapped text-based narrative data by those who were eyewitnesses to the riots with GIS-based, point-distribution data representing the 1992 Los Angeles riots' damaged structures. Susan Chase (2005, p. 656) defines narrative as "retrospective meaning making—the shaping or ordering of past experiences" by describing the stories of

others' empirical worlds. Thus, the narrative text represents a multiplicity of "nonmeasurable" (Pavlovskaya 2006, p. 2015) observations and experiences in addition to the locations of the riots' damaged structures. I use multiple-method geovisualization whereby the two data sets are complementary in that they work together to more richly explain what happened during the 1992 Los Angeles riots. As a cultural process, the United States has an extensive legacy of rioting (see Rucker and Nathaniel 2007). The 1992 Los Angeles riots therefore provide a contemporary case study with ample data for geographers to creatively combine different methods and approaches. By doing this, I hope to contribute to the broader literature engaged with other complex social and inherently spatial phenomena such as rock concerts (Vider 2004), neighborhood parades (Regis 1999), public protests (Noakes *et al*. 2005), and other spectacles.

Combining methods and approaches in practice

Quantitative methods are based upon "the use of mathematical techniques, theorems, and proofs in understanding geographical forms and relations," which consists of two primary applications—statistical methods and mathematical modeling (Barnes 2000, p. 663). Qualitative methods, on the other hand, are "a set of tools developed to pursue the epistemological mandate of the philosophies of meaning" whereby researchers use an array of techniques, such as interviews, landscape interpretation, and participant observation, to better understand individual and group interactions within larger, complex societies (Smith 2000, p. 660). Scholars have viewed qualitative and quantitative methods as incompatible, particularly during the early development of GIS in geography (see Schuurman and Pratt 2002). However, Dennis (2006, p. 2049) argues that GIS "has never been a purely quantitative enterprise" because its points, lines, and polygons can be built from nominal data. Likewise, Sheppard (2001, p. 547) explains how GIS analyses are not entirely positivistic because they "depend on secondary databases containing empirical representations of the world." Cope (2003, 2005) demonstrates how coding techniques used to organize qualitative data—such as diaries, interviews, and oral histories—are highly analytical and structured endeavors. Hence, the processes that underlie qualitative and quantitative methods are not mutually exclusive and therefore incompatible but can instead work together (Pavlovskaya 2006; see also Kitchin and Tate 2000).

   An advantage in using both qualitative and quantitative methods is that the researcher can combine multiple data sets to answer different questions. For Morse (2003, p. 189), researchers drawing from more than one method "are able to obtain a more complete picture of human behavior and experience." For Philip (1998, p. 261), combining methods "represents a polyvocal approach to research, where employing a range of methodological strategies means that the researcher does not necessarily

privilege a particular way of looking at the social world.'' Geographers and others have combined qualitative and quantitative methods to illuminate contradictory perceptions of cultural landscapes (Jiang 2003; Robbins 2006), reveal informal and non-monetary economies during economic transition (Pavlovskaya 2002), and discover the impacts and meanings of community gardens (Knigge and Cope 2006).

When combining qualitative and quantitative methods, scholars from a variety of fields have made distinctions between mixed-methods and multiple-methods research (see Tashakkori and Teddlie 2003), although there are not universally agreed upon definitions (Elwood 2010). In seeking guidance from geographers, Lorna Philip (1998, p. 264) describes a mixed-methods approach as ''referring to a situation whereby two or more methods are used to address a research question at the same stage in the research process, in the same place, and with the same research subjects.'' Therefore, a rigorous mixed-methods approach is often an iterative and recursive process that, as Knigge and Cope (2006, p. 2028) explain, ''involve[s] multiple rounds of data collection, display, and analysis, with critical reflection embedded at each stage.''

I use a multiple-methods approach, or what Hunter and Brewer (2003, p. 578) describe as ''a strategy for overcoming each method's weaknesses and limitations by deliberately combining different types of methods within the same investigations.'' The thrust of applying multiple methods is not to cross reference data sets, as with a mixed-methods approach, but instead to integrate different points of view. Andrea Nightingale (2003) demonstrates with her work on forest change in Nepal that no single method is complete; in fact, knowledge itself is partial. Similarly, both data sets used for this paper provide specific information: GIS identifies the locations of damaged structures, whereas narratives identify the locations of personal observations and experiences. Together, damaged structures and narratives provide different but complementary information, even though they respectively stem from quantitative and qualitative camps.

However, the practice of combining qualitative data with a traditionally quantitative-based GIS environment has been increasing (see Kwan and Knigge 2006). In fact, as Elwood (2009, p. 257) explains, much of the emerging GISience ''may rely heavily upon qualitative spatial knowledge and everyday forms of spatial reasoning.'' One approach is for GIS practitioners to collaborate with the people they are attempting to serve (Gilbert and Masucci 2006). In a Dallas, Texas, urban revitalization effort, technical facilitators worked in conjunction with locals in a ''bottom-up'' technique, or what Emily Talen (2000, p. 280) has dubbed BUGIS, whereby ''residents use GIS to communicate how they perceive their neighborhood or community, via their description, evaluation, or perception for their local environment.'' In essence, BUGIS and other participatory-driven approaches are spatially based data sets that represent a ''multiplicity of

geographical realities'' (Dunn 2007, p. 616), which GIS practitioners can then map.

Narratives as a mappable data source

Narrative data, however, are different from data used for a BUGIS approach. BUGIS, as it relates to urban planning, is reminiscent of Peter Gould and Rodney White's (1974) work on mental maps where the authors examined perception and desirability of places. Both mental maps and narratives describe individual observations and experiences, and both can tell stories; but mental maps from their inception are inherently spatial, either cognitively or materially through mental sketch maps, whereas narratives are not. Mental sketch maps, when combined with GIS-based data, can add different spatial points of view. Samuel Dennis (2006) examined revitalization efforts in Harrisburg, Pennsylvania, comparing local youths' mental sketch maps with the city's GIS showing overall impact. The city demolished a number of dilapidated buildings and considered the vacant lots valuable real estate, but the neighborhood youth saw the vacant lots as neglected and unsafe. Similarly, Marie Cieri (2003) examined how civic boosters and others showcased queer tourism in Philadelphia. Mental sketch maps drawn by lesbian and bisexual women revealed less visible social spaces than those of gay men. As a result, activities appealing to women were largely overshadowed by what official tourist publications promoted as queer-friendly places of interest.

For this paper, however, I did not use mental sketch maps. Instead, I used narrative data and for these reasons. First, other scholars have used narrative data to examine the 1992 Los Angeles riots. Psychologists Jo Ann Farver and Dominick Frosch (1996) compared the violent content between children's narratives living in Los Angeles during the 1992 riots and a control group residing in several other cities. Folklorist Timothy Tangherlini (1999) identified narratives as means for Korean-Americans to help reconstruct their identity of post-riot Koreatown. Farver and Frosch (1996) and Tangherlini (1999) applied their narrative data differently, one as a coded data source for statistical analysis, the other for its contextual insights, respectively. My aim is to contribute to this literature by showing that narrative data on the riots can also have an insightful spatial component. Second, both mental maps and narratives are descriptive means of representing spatial data. But, as I will show, narrative data offers a different way of engaging readers, one that is made possible by an author's colorful use of language. Third, I wanted to mine published narratives as a less-common, but readily available, resource for the geovisualization of qualitative data and to briefly explore the limitations and challenges of this approach.

Because narratives are not inherently spatial, as are mental maps, geographers must sort through a narrative's content for mappable data.

Margaret Wickens Pearce (2008) referenced the diary of John Macdonell, a fur trader who voyaged into the US/Canadian Upper Great Lakes region for the North West Company in 1793. Macdonell wrote detailed, daily entries from which Pearce was able to map his route. Originally, Pearce (2008) mapped the place names where Macdonell camped each night, tracing his voyage. Despite the abundance of place names, however, the original map lacked context: "I realized that I had a problem," Pearce states, "which was that by merely marking locations, even named locations, I was leaving behind most of the story" (2008, p. 24). To map context, Pearce selected one or two telling sentences from each day of Macdonell's diary. Pearce then matched the text with the corresponding place names along the fur trader's route. In conjunction, Pearce assigned colors for each day to represent feelings of joy or fear coupled with environmental conditions such as foggy or sunny weather. As a result, the reader views Macdonell's voyage framed temporally and spatially, with each day and color revealing a "changing emotional landscape" (Pearce 2008, p. 25).

Geographers have also been integrating disparate contextual sources into GIS and performing user-programmable sequences of finite calculations—or algorithms—for spatial analysis (see Kwan 2008, 2004, 2002; Kwan and Ding 2008). One type of integration, or what Kwan and Ding (2008, p. 448) describe as "geo-narratives," is a process of "extending current GIS capabilities for the analysis and interpretation of narrative materials such as oral histories, life histories, and biographies." The geo-narrative process generates algorithmic data based on individual movement over time and through space, uses interface software to store and organize the data, which is then brought into GIS to map a three-dimensional construction of time-space paths where a vertical axis indicates time of day and horizontal axes indicate spatial movement. The result is a map with a continual line representing an individual's travels. For example, Kwan's (2008) use of narrative data to map a Muslim woman's everyday movements within Columbus, Ohio, shows perceptions of danger based on increased hate violence towards Muslims in general following the 11 September 2001 attacks in the United States.

Three case studies mapping narratives of the 1992 Los Angeles riots

In this section, I draw from five published narratives describing individual observations and experiences during the 1992 Los Angeles riots. Each narrative references the names of intersecting streets, which I used to identify a narrator's location. I then placed the narrative text within a corresponding GIS-based map that shows point-distribution data representing damaged structures, as exemplified in the following three case studies. For Case Study One (Alan-Williams 1994) and Case Study Two (Phillips 2002), I have mapped the riots at the block level. Figure 3 shows
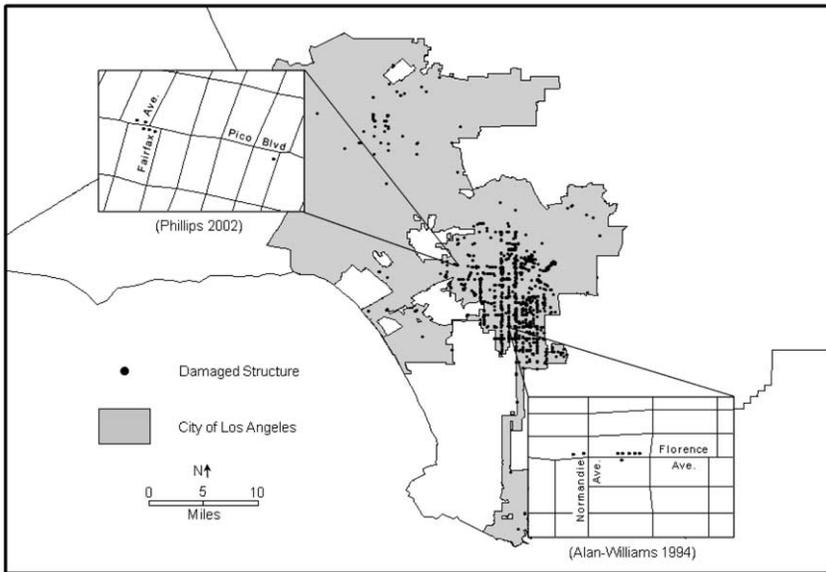
Figure 3.   Locations of case study one and two during the 1992 Los Angeles riots.

the locations of both case studies in relation to each other and in relation
to the damaged structures throughout Los Angeles. There are two
advantages of mapping narratives at the block level. First, I am able to
insert a greater number of each narrator's text into the maps, providing
more details about their observations and experiences. Second, I am able
to show CDDS (1992) metadata for most of the damaged structures,
metadata such as structure function and type of damage—details that are
impossible to distinguish when mapping the 1992 Los Angeles riots in
their entirety (as with Figure 2). Case Study Three maps Koreatown and
its adjacent neighborhoods, revealing a multiethnic participation during
the riots, which is a key distinction that sets the 1992 Los Angeles riots
apart from past riots in the United States.

Case study one

For the first case study, I drew from the memoir of African-American
actor and writer Gregory Alan-Williams (1994). Perhaps best known for
playing Garner Ellerbee in the television drama Baywatch, Alan-
Williams's memoir is a reflection of past challenges intertwined with his
experiences during the 1992 Los Angeles riots. Alan-William describes
several, on-the-ground experiences, each vivid and richly detailed. As a
reader, I was captivated by his stories. As a geographer, I wanted to map
an act of humanity amid the riots' seemingly ubiquitous brutality. Most
outstanding was his heroic effort to help stranded Japanese motorist

Takao Hirata, which I mapped in Figure 4. The following is a summary of this experience.

On the afternoon of Wednesday 29 April, Alan-Williams was driving from the gym to the grocery store, where, upon his wife's request, he picked up grilling coals and chicken for that evening's dinner. Listening to his radio along the way, Alan-Williams heard how motorists were being pulled from their vehicles and beaten at the intersection of Florence and Normandie Avenues, approximately three miles away. Yearning to help, Alan-Williams drove to Brighton Avenue, one block west of Normandie, where he parked his car. He walked up Brighton and made a right onto Florence. On the north side of Florence between Brighton and Normandie, people were looting a liquor store while flames licked out of the roof. At Florence and Normandie, abandoned vehicles, one still smoldering, another smashed, clogged the intersection. As motorists detoured around the wreckage, some also needed to dodge a barrage of flying bricks and bottles. Black motorists appeared to pass without incident, while others were attacked. Broken makeup containers, official documents, and other personal items, including an orange overnight bag, were among the debris scattered across the ground. When Alan-Williams examined the orange overnight bag, he read the name on its identification tag: Reginald Denny (Alan-Williams 1994).

Later, a brown, two-door Ford Bronco entered the intersection, its windshield smashed by a brick. The driver, Takao Hirata, stopped and
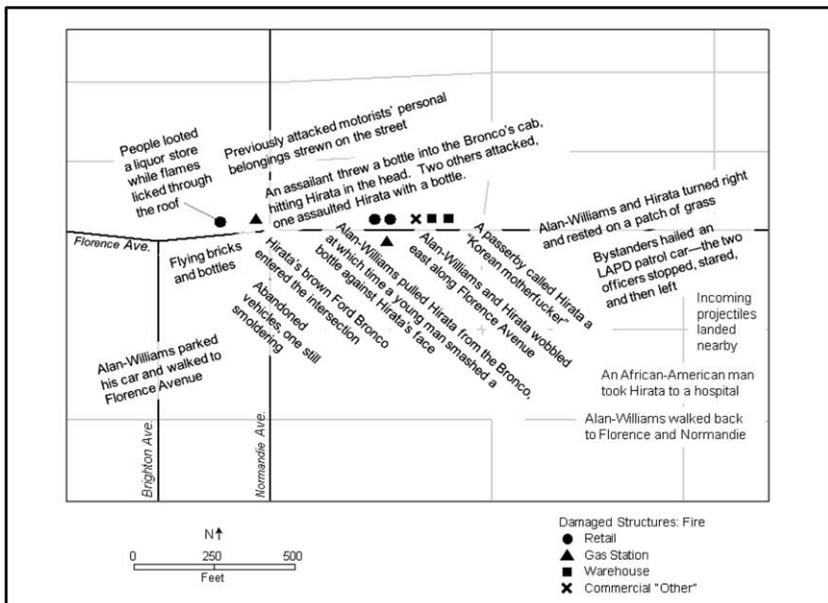

Figure 4.   Riot narrative from Alan-Williams (1994).

locked both doors. Objects pelted the vehicle, shattering all remaining windows. An assailant approached the vehicle, cocked his arm, and threw a bottle into the cab of the Bronco, hitting Hirata in the head. Another assailant climbed in through the back of the Bronco and attacked Hirata from behind, while a third assailant entered from the passenger's side and beat Hirata with a bottle. As people began to open the driver-side door, Alan-Williams positioned his body between Hirata and his attackers, removing the unconscious man from the vehicle. Seconds later, on the street, a young man ran up to Alan-Williams and Hirata and swung a bottle with enough force that it disintegrated against Hirata's face. Still, Alan-Williams managed to pull Hirata over to the sidewalk. Hirata regained consciousness, and with one arm around Alan-Williams's waist and another over his shoulder, the two men wobbled east on Florence. As they walked, some passers-by smiled while others were indifferent, and a few stood horrified. One teenage girl exclaimed that Hirata deserved his situation for the death of Latasha Harlins,[6] calling the injured Japanese man a "Korean motherfucker" (Alan-Williams 1994, p. 91).

After two blocks, they turned down a side street where Alan-Williams sat Hirata down in a patch of grass. The spectacle of the bleeding man attracted bystanders' attention, a few of whom offered help. After several minutes, an LAPD patrol car was heading east on Florence, and bystanders hailed the two officers. The officers backed up and stopped in front of Alan-Williams and Hirata, stared at them for approximately 25 seconds, and drove away. With projectiles still landing near them, Alan-Williams escorted Hirata further down the street when an African-American man driving a brown van pulled up and offered to take Hirata to a hospital. After securing Hirata in the front seat of the van, the driver pulled away, and Alan-Williams walked back to the intersection of Florence and Normandie (Alan-Williams 1994).

Figure 4 represents other significant occurrences in addition to the damaged structures. It also represents Alan-Williams's (1994) narrative as a spatial and temporal process, and what he and Hirata experienced along the way. I placed each narrative text on the map in the order it was written by Alan-Williams. Moving east, away from the intersection of Florence and Normandie, Alan-Williams and Hirata had become increasingly safe from direct physical attacks. Hirata did encounter a negative reaction by one passerby but eventually experienced another act of humanity as an unidentified African-American man drove him to a hospital. This is just one example of perhaps hundreds representing violence against people that occurred at the now infamous intersection of Florence and Normandie.

To complement this narrative, the CDDS (1992) shows that the eight damaged structures along Florence Avenue near Normandie were all a result of fire. In addition to fires and vandalism, the CDDS (1992) roughly describes the function or use for most damaged structures. Alan-Williams

referenced only one fire in his narrative, a retail structure near the northeast corner of Brighton and Florence, indicated by the circle and connecting dotted line. However, Alan-Williams supplied additional details in that this retail structure was a liquor store, and that people were looting the liquor store while its roof was on fire. As a GIS data point, this damaged structure tells a story, but it only tells the last chapter when its fate was revealed—a result of fire. Without the accompanying narrative by Alan-Williams, we would not know part of what led to a dynamic result, namely that the liquor store was looted and vandalized before it was burned.

Case study two

For the second case study, I used a brief work by Gary Phillips (2002) whose narrative has two characteristics worth noting. First, in addition to what he saw, Phillips also described what he heard. Mapping sound has its challenges, which I will discuss later, but it attempts to expand geovisualization techniques to include narrative data generated by the other human senses. Second, Phillips is a published crime and mystery writer. Perhaps as a result, his writing style has a metaphorical quality that is uncommon among riot narratives. And, although it is a short passage, its metaphorical quality thickens the narrative text, and—in turn—the mapped narrative. Therefore, narrative data can go beyond utility, describing just the facts, but it can be playful and experimental in its style as well.

On the morning of Thursday 30 April, Gary Phillips (2002) went to work thinking the worst of the riots happened the night before. By midday, however, the rioting had continued, and he rushed to meet his wife and two young children gathered at a friend's home on Ogden Drive in Los Angeles. Phillips (2002, pp. 129–130) recounted those experiences ten years later, producing the following narrative, which I mapped in Figure 5:

> The family gathered at a friend's second story duplex with others, feeling as though we were in a nameless land experiencing an ill-conceived coup. People were clamoring in the streets, darting here and there as gun shots whined through the air, cars slammed into each other and buildings, sirens screamed, and police and news helicopters swarmed about pyres of flame like giant mechanical moths. Shit was happening all around, the neighborhoods were a torrent of rip and run, yet all you could do was watch out your window—unsure of who was in charge and who wanted to be.

> Stores not five blocks from us blazed red and grey into the darkening sky as the local Vons at Pico and Fairfax was looted. Three middle-aged women, one with a pistol in her apron pocket, stopped a roving band of gangbangers from torching the Texaco station at the corner of our friend's duplex on Ogden.
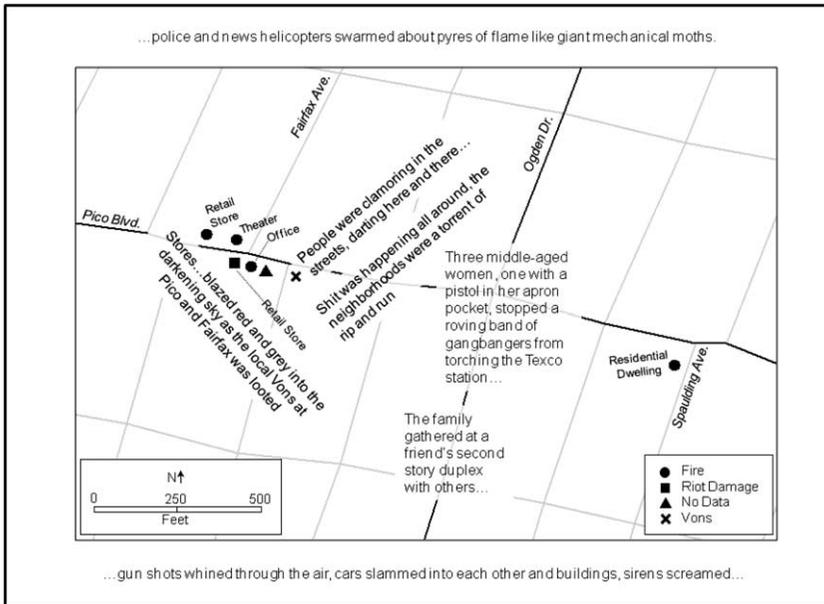
Figure 5.   Riot narrative from Phillips (2002).

In his narrative, Phillips (2002, p. 130) tells how "Stores ... blazed red and grey" to describe the cluster of structural fires around Pico and Fairfax. From the CDDS (1992) metadata, I could identify the general use for four of the five data points in this cluster. In this case, the point-distribution data are able to elaborate upon the narrative data. Moreover, Phillips mentions people looting the Vons grocery store. An Internet search revealed that Vons is located on the east side of Fairfax Avenue, just south of Pico Boulevard, but this site is absent from both the CDDS (1992) and the Ong and Hee (1993) data sets and would not have been mapped using this data alone.[7] Most intriguing about Phillips's narrative are the three middle-aged women who averted a group from setting ablaze a gas station, yet the women's profound actions are invisible when mapping only the riots' destruction. However, if the group of potential arsonists had been successful, their actions would have likely become another damaged structure represented in Figures 2 and 5.

Case study three

Riots based on racial prejudices are deeply embedded in American cultural history, especially during the twentieth century (see Rucker and Nathaniel 2007). According to DiPasquale and Glaeser (1998), the United States is the world's second-most riotous country after India. This is largely due to an outburst of riots during the late 1960s when inner-city, mostly poor

black residents turned against the police, attacked white bystanders, and looted, vandalized, and burned white-owned establishments (Rucker and Nathaniel 2007). However, the racial and ethnic composition of riot participants has changed in Los Angeles. Adult arrest records indicate that the 1992 Los Angeles riots were not an African-American phenomenon. Rather, Latinos made up 51% of those arrested, with African Americans and whites representing 36% and 11%, respectively. In comparison, African Americans accounted for nearly 90% of those arrested during the Watts riots (Petersilia and Abrahamse 1996). Because of this difference, researchers at the Rose Institute of State and Local Government (1992a, p. 4) have stated that the 1992 events in Los Angeles "were America's first true multiethnic riots." Others have made similar assertions (see Johnson *et al.* 1992; Kwong 1992; Navarro 1993; Oliver *et al.* 1993; Tierney 1994). On the ground, writer Wanda Coleman observed, "As I was a witness, people—of nearly every ethnic description—were in the streets smiling as they looted" (2002, p. 37). For the third case study (Figure 6), I have used five short narratives, some no longer than a sentence, to show how narrative data coupled with GIS can identify occurrences of multiethnic participation.

For Figure 6, I also wanted to select narratives contrary to any presumption that riot participation means destruction. Using Koreatown and its adjacent neighborhoods as an example, I mapped narratives representing multiethnic participation where people worked together to
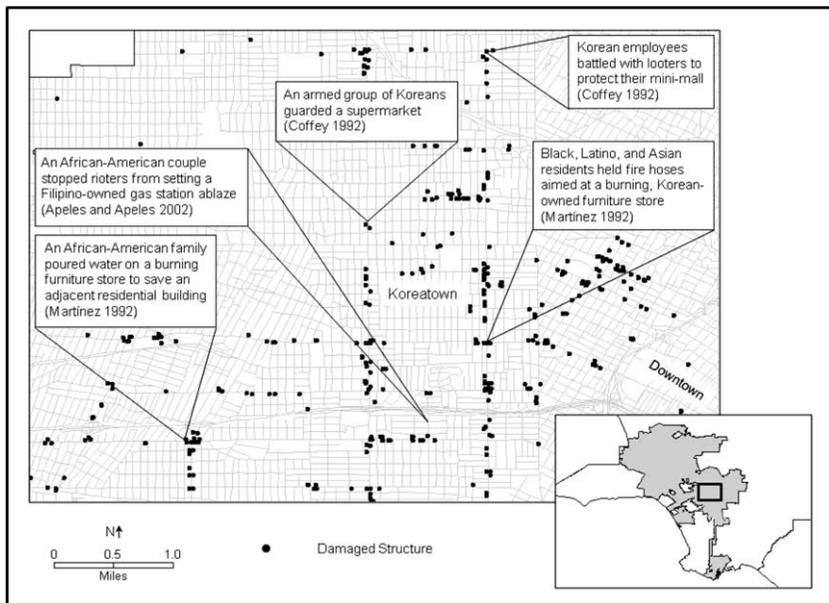

Figure 6.   Examples of multiethnic participation during the 1992 Los Angeles riots.

prevent arson and vandalism. By mapping narratives we begin to see the underlying processes of how human actions affected the riots' geography, not only through destruction but also through prevention. A riot's destruction is contingent largely upon the successes and failures of preventative actions by local law enforcement and other state and federal agencies along with efforts by civilians—civilians, at least during the 1992 riots, representing a variety of ethnicities. Although Figure 6 represents a sample, it nonetheless offers a leg of support for scholars asserting that the 1992 riots were a multiethnic event, and it suggests that perhaps the characteristics of riots in the United States are changing, just as they have in the past.[8] In the above case studies, narrative-based geovisualization reveals a complexity to the 1992 Los Angeles riots beyond violence and destruction but as a multiethnic event where groups and individuals prevented further damage, averted potentially destructive outcomes, and participated in acts of humanity.

Limitations and challenges of this study

Using narratives with GIS can add a contextual richness to our under-standing of events like the 1992 Los Angeles riots, but it does have limitations and can present some challenges. In this section, I discuss specific limitations and challenges using the three case studies as examples, followed by a justification or a solution. This is not an exhaustive list; rather, it is meant to identify issues I encountered while trying to map narrative data. Perhaps the most prominent limitation is the small sample of narratives used in this study. Drawing from five published sources in three case studies to complement the 1,234 mappable locations from the CDDS (1992) and Ong and Hee (1993) data sets may seem imbalanced. But as Chase (2005, p. 652) explains:

> And although all qualitative researchers address the question of the relationship between the relatively small "sample" they study and some larger whole, this question is particularly poignant for narrative researchers, who often present narratives of a very small number of individuals—or even of just one individual—in their published works.

With a smaller sample, I am able to examine the narratives in more detail, particularly in Case Studies One (Figure 4) and Two (Figure 5). Therefore, borrowing from Lorraine Dowler's (2001, p. 158) discussion on partici-pant observation and applying it towards the use of narrative: "what one gains in depth, one gives up in breadth."

Another limitation is that Case Studies One and Two each represent only one point of view among a multiplicity of observations and experiences by those who were also witness to, or a part of, the riots. Both Alan-Williams (1994) and Phillips (2002) mention other people on

the street during the same series of events, yet these individuals would have slightly—or perhaps radically—different narratives, depending on their focus, location, and level of participation. Mapping a multiplicity of observations and experiences is intriguing but beyond the scope of these two case studies. Instead, the intent of this paper is to map individual narratives as a geovisualization of qualitative data, similar to Kwan and Ding's study that uses only one narrative because their purpose is "mainly to illustrate the approach" (2008, p. 453; see also Kwan 2008).

A final limitation is with Case Study Three (Figure 6). The two narratives in Coffey (1992) describe separate groups, an armed group of Koreans and a group of Korean employees, both standing guard to protect their businesses. Although each narrative identifies intersecting streets, allowing me to map their locations, the narratives do not inform the reader of the outcome. At the end of the riots, the areas surrounding both businesses had damaged structures, but since only the cross streets are mentioned in the narratives, not the actual addresses, the precise locations of the supermarket and mini-mall are unknown. Therefore, I could not cross-reference the supermarket or the mini-mall with the GIS point-distribution data to determine whether either group was successful in protecting their property.

Along with limitations, mapping narratives also presents some challenges. Perhaps a creative challenge is how to map the sounds of the riots. In Case Study Two (Figure 5), Phillips (2002) describes gunshots, sirens, and other auditory cues, contributing to a riot soundscape. As Krygier and Wood state, "you can map just about *any* data you can collect from the environment" (2005, p. 51, original emphasis), which in their case includes sound. The authors provide an example of recording stations in Vancouver, British Columbia, that measure sound levels. The sound-level data are then classified into three categories and mapped. In this example, the nearly two-dozen sound recorders are stationary and placed in equal intervals. With the exception of instrument failure, each recording station provides mappable data representing specific locations (Krygier and Wood 2005). However, unlike visual narratives that reference intersecting streets, auditory narratives in Figure 5 pose a different challenge. Although Phillips (2002) describes specific sounds in his narrative, he did not identify where the sounds were coming from. As a result, I could not place Phillips's auditory-based text in the map, yet this information is still an essential part of his narrative. But because I did not want Phillips's auditory-based text "marginalized" (see Wood 1992, p. 87), I instead placed this data outside the map's frame.

Another challenge is searching through narratives for mappable data. I found several published sources containing narratives of the riots, including edited volumes with contributions by activists, journalists, writers, and others (Hazen 1992; James 2002; Tervalon 2002) as well as accounts by law enforcement (Vernon 1993; Delk 2000). Although these

narratives told rich and detailed stories, most did not reference intersecting streets, so I could not use them as mappable data. In several cases, narratives made reference to a street name but not to an intersecting cross street. Others were ambiguous, as one police officer recalls, "'I was somewhere near 114th and Western'" (quoted in Vernon 1993, p. 23). These partial references and ambiguous locations are problematic, especially at the block level, and therefore not used in this paper.

A related challenge is the selection process deciding whether to map a narrator's original text or to edit his text based upon the researcher's discretion. Pearce (2008, p. 25) mapped Macdonell's original text by using "his words, his voice, directly in the map, verbatim." Because the Phillips (2002) narrative in Case Study Two (Figure 5) is short and metaphorically rich, I have done the same. In comparison, the Alan-Williams (1994) narrative in Case Study One (Figure 4) is lengthy, extending over sixty pages, and woven with information not germane for this paper. The challenge here is twofold: how to represent a lengthy narrative yet, at the same time, not clutter the map with unnecessary text. To do this, I summarized the original text and inserted it into this paper as a supplement for Figure 4. I also summarized the original text before placing it on the map for a cleaner geovisualization.

As part of the selection process, Denis Wood (1992) discusses a United States Geological Survey (USGS) quadrangle map for his neighborhood in Raleigh, North Carolina, noting its contour lines, landmark buildings, and place names. What is missing, Wood explains, is the traffic on the road and the squirrels nesting in his pecan tree. Why? Because such things are not considered permanent features by the USGS. The CDDS (1992) is similar to Wood's copy of the West Raleigh Quadrangle in that both were prepared by official government agencies, and these official government agencies were particular in their selection process. Hopefully, a city that endures a riot can soon rebuild, so its damaged structures may not be considered permanent features by the USGS. But for assessing the most visible and immediate indicator of a riot's destruction, damaged structures are more permanent than are the other ephemeral human actions, such as Alan-Williams's (1994) experience in Figure 4. As Wood (1992) argues, the notion of what constitutes permanent, and therefore important, is not explicitly revealed on the resulting map. Yet this vagueness often gives the map a taken-for-granted objectiveness. I am neither questioning the efforts by the City of Los Angeles to assess riot damage, nor am I challenging the validity of quantitative analysis based on damaged structures. What I am arguing, drawing from Wood (1992), is what qualifies as destruction during the 1992 Los Angeles riots originates from a selection process that reflects the interest of an official government agency. My interest is in using a multiple-methods approach to map narrative data along side point-distribution data, hence showing people's experiences in addition to the riots' damaged structures. However, my

decisions regarding what narratives to use, and within these narratives, what texts to draw from, edit, and map are highly selective but no more or less selective than the decisions by Ridland (1993) and Bergesen and Herman (1998) regarding what hypotheses to test or what statistical calculations to use.

It is often difficult to locate and map human actions, so another challenge is where to place narrative text within a map. Case Study Three (Figure 6) is the least problematic in that the narratives all reference the names of intersecting streets. With Case Study One (Figure 4) the narrative is linear, meaning each experience is told in the order that it occurs. Adding to this, a map retracing the path of travel accompanies the narrative (see Alan-Williams 1994, p.103), which allowed me to cross-reference the two data sources. Even with the ability to cross-reference the narrative with the map, my placement of Alan-Williams's text within Figure 4 is nonetheless an approximation, particularly around the chaotic intersection of Florence and Normandie. The most challenging, however, is Case Study Two (Figure 5) and for the following reasons. First, Phillips (2002) states his friend's duplex is on Ogden but does not reference a cross street. Second, Phillips does not reference a cross street regarding the actions of the three middle-aged women. Third, Phillips does not reference any street in his observations of "people clamoring...darting" and things "happening all around" (2002, p. 130). Admittedly, none of Phillips's narrative texts in Figure 5 are accurately placed, at least in the sense of their precise locations. In defense, Wood (1992, p. 21) compares the advancements of global positioning satellite (GPS) technology, with its on-the-ground accuracy measured in centimeters, to a pane of framed glass acting as a window in which to view the world: "If you're paying attention to the glass," Wood states, "you're not paying attention to what you're seeing through the window." Certainly, accuracy is important, as I placed each narrator's text based on the information they provided. But accuracy is not a zero-sum game. If it were, I could not map any narrative, just as cartographers—even when using precise GPS technology—could not create maps without encountering distortion based on their chosen map projection (see Wood 1992, Chapter 3). Even though the process of mapping narratives is susceptible to a geographical margin of error, what is gained are representations that contribute to a richer understanding of complex social and inherently spatial phenomena, such as the 1992 Los Angeles riots.

Conclusion

Robert Rundstrom states that: "Mapping is fundamental to the process of lending order to the world" (1990, p. 155). But as geographers, how do we lend order to spatially complex social phenomena involving human actions, particularly when these human actions are often chaotic, ephemeral, and

spontaneous? One approach is to combine multiple data sources in an attempt to gain clearer insight of the many underlying processes that contribute to such phenomena. In recognizing that no data set is complete, narrative-based geovisualization is a means to represent a variety of other significant occurrences that complement quantitatively based GIS environments and other mapping endeavors. By doing this, we can integrate partial data sets to produce a more robust understanding of cultural events.

Acknowledgements

Notes

1. Dykes *et al.* (2005) define geovisualization as a multi-disciplinary field focused on innovative approaches and techniques representing spatial data.
2. Los Angeles also experienced the Zoot Suit riots in 1943, which were a series of physical altercations primarily between local Mexican Americans and US servicemen in town on leave. In contrast to the Watts riots in 1965 and the 1992 Los Angeles riots, the Zoot Suit riots had no fatalities or major property damage and were mostly contained within downtown Los Angeles (see Mazón 1984).
3. Data acquired from the United States Census Bureau website. *1990 Summary Tape File 1 (STF 1)-100-Percent data, Quick Tables* [online]. Available from: http://factfinder.census.gov/servlet/QTGeoSearchByListServlet?ds_name=DEC_ 1990_STF1_&_lang=en&_ts=220396908526 [Accessed 29 December 2008].
4. Data acquired from the United States Census Bureau website. *1990 Census Tract Cartographic Boundary Files* [online]. Available from: http://www.census. gov/geo/www/cob/tr1990.html#shp [Accessed 29 December 2008].
5. Figure acquired from the United States Census Bureau, Table 22. Population of the 100 Largest Urban Places: 1990. Available from: http://www.census.gov/ population/www/documentation/twps0027/tab22.txt [Accessed 27 May 2009].
6. On 6 March 1991, security cameras at the Empire Liquor Market videotaped Korean storeowner Soon Ja Du shoot and kill suspected shoplifter, fifteen-year-old Latasha Harlins. Du's sentence was a $500 fine, 400 hours of community service, and probation for five years—a sentence many African Americans thought too lenient, resulting in further animosity between black residents and Korean merchants (Sanders-McMurtry 2007).
7. Vons is located at 1430 S. Fairfax, Los Angeles, CA 90019. See Vons website, *Find a Store* feature [online]. Available from: http://www.vons.com/ifl/grocery/ store-locator [Accessed 29 December 2008].
8. Sociologist Morris Janowitz (1969) discusses the changing nature of riots in the United States, from *communal-* to *commodity*-type events.

References

Adams, J.S., 1972. The geography of riots and civil disorders in the 1960s. *Economic Geography*, 48 (1), 24–42.

Alan-Williams, G., 1994. *A gathering of heroes: reflections on rage and responsibility—a memoir of the Los Angeles riots*. Chicago: Academy Chicago Publishers.

Apeles, T. and Apeles, F., 2002. The getaway. In: J. Tervalon, ed. *Geography of rage: remembering the Los Angeles riots of 1992*. Los Angeles: Really Great Books, 13–15.

Baldassare, M., ed. 1994. *The Los Angeles riots: lessons for the urban future*. Boulder, CO: Westview Press.

Barnes, T., 2000. Quantitative methods. *In*: R.J. Johnston, D. Gregory, G. Pratt, and M. Watts, eds. *The dictionary of human geography*. 4th ed. Malden, MA: Blackwell, 663–664.

Bergesen, A. and Herman, M., 1998. Immigration, race, and riot: the 1992 Los Angeles uprising. *American Sociological Review*, 63 (1), 39–54.

Cannon, L., 1997. *Official negligence: how Rodney King and the riots changed Los Angeles and the LAPD*. New York: Times Books.

Canot, R.E., 1967. *Rivers of blood, years of darkness*. New York: Bantam Books.

Chase, S.E., 2005. Narrative inquiry: multiple lenses, approaches, voices. *In*: N.K. Denzin and Y.S. Lincoln, eds. *The handbook of qualitative research*. 3rd ed. Thousand Oaks, CA: Sage, 651–679.

Cieri, M., 2003. Between being and looking: queer tourism promotion and lesbian social space in greater Philadelphia. *ACME*, 2 (2), 147–166.

Civil Disorder Damage Survey, 1992. Los Angeles: City of Los Angeles, Department of Building and Safety.

Coffey, S., ed. 1992. *Understanding the riots: Los Angeles before and after the Rodney King case*. Los Angeles: Los Angeles Times.

Cohen, N.E., ed. 1970. *The Los Angeles riots: a socio-psychological study*. New York: Praeger.

Coleman, W., 2002. The riot inside me: a statistic speaks. *In*: J. Tervalon, ed. *Geography of rage: remembering the Los Angeles riots of 1992*. Los Angeles: Really Great Books, 37–47.

Cope, M., 2003. Coding transcripts and diaries. *In*: N. Clifford and G. Valentine, eds. *Key methods in geography*. Thousand Oaks, CA: Sage Publications, 445–459.

Cope, M., 2005. Coding qualitative data. *In*: I. Hay, ed. *Qualitative research methods in human geography*. 2nd ed. New York: Oxford University Press, 223–233.

Crump, S., 1966. *Black riot in Los Angeles: the story of the Watts tragedy*. Los Angeles: Trans-Anglo Books.

Delk, J., 2000. MOUT: a domestic case study—the 1992 Los Angeles riots. *In*: R.W. Glenn, ed. *The city's many faces: proceedings of the RAND Arroyo-MCWL-J8 UWG Urban Operations Conference, April 13–14, 1999*. Santa Monica, CA: RAND, 79–156.

Dennis, Jr., S.F., 2006. Prospects for qualitative GIS at the intersection of youth development and participatory urban planning. *Environment and Planning A*, 38 (11), 2039–2054.

DiPasquale, D. and Glaeser, E.L., 1998. The Los Angeles riot and the economics of urban unrest. *Journal of Urban Economics*, 43 (1), 52–78.

Dousset, B., Flament, P., and Bernstein, R., 1993. Los Angeles fires seen from space. *Eos*, 74 (3), 33–40.

Dowler, L., 2001. Fieldwork in the trenches: participant observation in a conflict area. *In*: M. Limb and C. Dwyer, eds. *Qualitative methodologies for geographers*. London: Arnold, 153–164.

Dunn, C.E., 2007. Participatory GIS—a people's GIS? *Progress in Human Geography*, 31 (5), 616–637.

Dykes, J., MacEachren, A.M., and Kraak, M-J. 2005. Exploring geovisualization. *In*: J. Dykes, A.M. MacEachren, and M-J. Kraak, eds. *Exploring geovisualization*. Amsterdam: Elsevier, 3–19.

Elwood, S., 2009. Geographic Information Science: new geovisualization technologies—emerging questions and linkages with GIScience research. *Progress in Human Geography*, 33 (2), 256–263.

Elwood, S., 2010. Mixed methods: thinking, doing, and asking in multiple ways. *In*: D. DeLyser, S. Aitken, M. Crang, S. Herbert, and L. McDowell, eds. *The SAGE handbook of qualitative geography*. Thousand Oaks, CA: Sage.

Farver, J.M. and Frosch, D.L., 1996. L.A. stories: aggression in preschoolers' spontaneous narratives after the riots of 1992. *Child Development*, 67 (1), 19–32.

Fogelson, R.M., ed. 1969. *Mass violence in America: the Los Angeles riots of 1965*. New York: Arno Press.

Gilbert, M.R. and Masucci, M., 2006. The implications of including women's daily lives in a feminist GIScience. *Transactions in GIS*, 10 (5), 751–761.

Gooding-Williams, R., ed. 1993. *Reading Rodney King: reading urban uprising*. New York: Routledge.

Gould, P. and White, R., 1974. *Mental maps*. Baltimore, MD: Penguin Books Inc.

Hazen, D., ed. 1992. *Inside the L.A. riots: what really happened—and why it will happen again*. New York: Institute for Alternative Journalism.

Horne, G., 1995. *Fire this time: the Watts uprising and the 1960s*. Charlottesville, VA: University of Virginia Press.

Hunt, D.M., 1997. *Screening the Los Angeles "riots": race, seeing, and resistance*. New York: Cambridge University Press.

Hunter, A. and Brewer, J., 2003. Multimethod research in sociology. *In*: A. Tashakkori and C. Teddlie, eds. *Handbook of mixed methods in social & behavioral research*. Thousand Oaks, CA: Sage, 577–594.

Hutchings, A.W., 1997. *A historical analysis of the 1992 Los Angeles riots*. Thesis (PhD). Pepperdine University.

Jackson, M.R., Johnson, Jr., J.H., and Farrell, Jr., W.C. 1993. *After the smoke has cleared: an analysis of selected responses to the Los Angeles civil unrest of 1992*. University of California Los Angeles, Center for the Study of Urban Poverty.

James, D., ed. 2002. *The Los Angeles riots: three decades of revolution*. Nashville, TN: Tenacious Entertainment.

Janowitz, M., 1969. Patterns of collective racial violence. *In*: H.D. Graham and T.R. Gurr, eds. *The history of violence in America: historical and comparative perspectives*. New York: Praeger, 412–444.

Jencks, C., 1993. *Heteropolis: Los Angeles, the riots and the strange beauty of hetero-architecture*. London: Academy Group Ltd.

Jiang, H., 2003. Stories remote sensing images can tell: integrating remote sensing analysis with ethnographic research in the study of cultural landscapes. *Human Ecology*, 31 (2), 215–232.

Johnson, Jr., J.H., Jones, C.K., Farrell, Jr., W.C., and Oliver, M.L., 1992. *The Los Angeles rebellion, 1992: a preliminary assessment from ground zero*. University of California Los Angeles, Center for the Study of Urban Poverty.

Kitchin, R. and Tate, N.J., eds. 2000. *Conducting research into human geography: theory, methodology, and practice*. Harlow, Essex: Pearson Education Limited.

Knigge, L. and Cope, M., 2006. Grounded visualization: integrating the analysis of qualitative and quantitative data through grounded theory and visualization. *Environment and Planning A*, 38 (11), 2021–2037.

Krygier, J. and Wood, D., 2005. *Making maps: a visual guide to map design for GIS*. New York: The Guilford Press.

Kwan, M.-P., 2002. Feminist visualization: re-envisioning GIS as a method in feminist geographic research. *Annals of the Association of American Geographers*, 92 (4), 645–661.

Kwan, M.-P., 2004. GIS methods in time-geographic research: geocomputation and geovisualization of human activity patterns. *Geografiska Annaler B*, 86 (4), 267–280.

Kwan, M.-P., 2008. From oral histories to visual narratives: re-presenting the post-September 11 experiences of the Muslim women in the USA. *Social & Cultural Geography*, 9 (6), 653–669.

Kwan, M.-P. and Ding, G., 2008. Geo-narrative: extending geographic information systems for narrative analysis in qualitative and mixed-method research. *Professional Geographer*, 60 (4), 443–465.

Kwan, M.-P. and Knigge, L., 2006. Doing qualitative research using GIS: an oxymoronic endeavor? *Environment and Planning A*, 38 (11), 1999–2002.

Kwong, P., 1992. The first multicultural riots. *In*: D. Hazen, ed. *Inside the L.A. riots: what really happened—and why it will happen again*. New York: Institute for Alternative Journalism, 88–93.

Martínez, R., 1992. Riot scenes. *In*: D. Hazen, ed. 1992. *Inside the L.A. riots: what really happened—and why it will happen again*. New York: Institute for Alternative Journalism, 30–34.

Matei, S.A. and Ball-Rokeach, S., 2005. Watts, the 1965 Los Angeles riots, and the communicative construction of the fear epicenter of Los Angeles. *Communication Monographs*, 72 (3), 301–323.

Mazón, M., 1984. *The zoot-suit riots*. Austin, TX: The University of Texas Press.

McCone, J.A., 1965. *Violence in the city—an end or a beginning: a report by the governor's commission on the Los Angeles riots*. Los Angeles: State of California, Governor's Commission on the Los Angeles Riots.

Meyers, M., Thomas, T., and Webb, H., 1992. Path of destruction. *Los Angeles Times*, 10 May, p. 31a.

Morrison, P.A. and Lowry, I.S., 1993. *A riot of color: the demographic setting of civil disturbance in Los Angeles*. Santa Monica, CA: Rand.

Morse, J.M., 2003. Principles of mixed methods and multimethod research design. *In*: A. Tashakkori and C. Teddlie, eds. *Handbook of mixed methods in social & behavioral research*. Thousand Oaks, CA: Sage, 189–208.

Navarro, A., 1993. The south central Los Angeles eruption: a Latino perspective. *Amerasia Journal*, 19 (2), 69–85.

Noakes, J.A., Klocke, B.V., and Gillham, P.F., 2005. Whose streets? police and protester struggles over space in Washington, DC, 29–30 September 2001. *Policing & Society*, 15 (3), 235–254.

Nightingale, A., 2003. A feminist in the forest: situated knowledges and mixing methods in natural resource management. *ACME*, 2 (1), 77–90.

Oliver, M.L., Johnson, Jr., J.H., and Farrell, Jr., W.C., 1993. Anatomy of a rebellion: a political-economic analysis. *In*: R. Gooding-Williams, ed., *Reading Rodney King/reading urban uprising*. New York: Routledge, 117–141.

Olzak, S. and Shanahan, S., 1996. Deprivation and race riots: an extension of Spilerman's analysis. *Social Forces*, 74 (3), 931–961.

Olzak, S., Shanahan, S., and McEneaney, E.H., 1996. Poverty, segregation, and race riots: 1960 to 1993. *American Sociological Review*, 61 (4), 590–613.

Ong, P. and Hee, S., 1993. *Losses in the Los Angeles civil unrest: April 29–May 1, 1992*. University of California Los Angeles, Center for Pacific Rim Studies.

Pavlovskaya, M.E., 2002. Mapping urban change and changing GIS: other views of economic restructuring. *Gender, Place and Culture*, 9 (3), 281–289.

Pavlovskaya, M.E., 2006. Theorizing with GIS: a tool for critical geographies? *Environment and Planning A*, 38 (11), 2003–2020.

Pearce, M.W., 2008. Framing the days: place and narrative in cartography. *Cartography and Geographic Information Science*, 35 (1), 17–32.

Petersilia, J. and Abrahamse, A., 1996. *The Los Angeles riot of spring, 1992: a profile of those arrested*. Santa Monica, CA: Rand.

Philip, L.J., 1998. Combining quantitative and qualitative approaches to social research in human geography—an impossible mixture? *Environment and Planning A*, 30 (2), 261–276.

Phillips, G.D., 2002. Destructive engagement. *In*: J. Tervalon, ed. *Geography of rage: remembering the Los Angeles riots of 1992*. Los Angeles: Really Great Books, 127–131.

Regis, H.A., 1999. Second lines, minstrelsy, and the contested landscapes of New Orleans Afro-Creole festivals. *Cultural Anthropology*, 14 (4), 472–504.

Ridland, M.T., 1993. The 1992 Los Angeles riot: a geographic perspective on south Los Angeles. Unpublished thesis. California State University, Long Beach.

Robbins, P., 2006. Research is theft: environmental inquiry in a postcolonial world. *In*: S. Aitken and G. Valentine, eds. *Approaches to Human Geography*. Thousand Oaks, CA: Sage, 311–324.

Rose Institute of State and Local Government, 1992a. *An atlas of South-Central Los Angeles*. Claremont, CA: Claremont McKenna College.

Rose Institute of State and Local Government, 1992b. *An atlas of South-Central Los Angeles (statistical appendix)*. Claremont, CA: Claremont McKenna College.

Rucker, W. and Nathaniel, J., eds. 2007. *Encyclopedia of American race riots*. Westport, CT: Greenwood Press.

Rundstrom, R.A., 1990. A cultural interpretation of Inuit map accuracy. *Geographical Review*, 80 (2), 155–168.

Sanders-McMurtry, K., 2007. Harlins, Latasha (1976–1991). *In*: W. Rucker and J. Nathaniel, eds. *Encyclopedia of American race riots*. Westport, CT: Greenwood Press.

Schuurman, N. and Pratt, G., 2002. Care of the subject: feminism and critiques of GIS. *Gender, Place and Culture*, 9 (3), 291–299.

Sears, D.O. and McConahay, J.B., 1973. *The politics of violence: the new urban blacks and the Watts riot*. Washington, DC: University Press of America.

Sheppard, E., 2001. Quantitative geography: representations, practices, and possibilities. *Environment Planning D: Society and Space*, 19 (5), 535–554.

Smith, S., 2000. Qualitative methods. *In*: R.J. Johnston, D. Gregory, G. Pratt, and M. Watts, eds. *The dictionary of human geography*. 4th ed. Malden, MA: Blackwell, 660–662.

Spilerman, S., 1970. The causes of racial disturbances: a comparison of alternative explanations. *American Sociological Review*, 35 (4), 627–649.

Spilerman, S., 1971. The causes of racial disturbances: tests of an explanation. *American Sociological Review*, 36 (3), 427–442.

Talen, E., 2000. Bottom-up GIS: a new tool for individual and group expression in participatory planning. *Journal of the American Planning Association*, 66 (3), 279–294.

Tangherlini, T.R., 1999. Remapping Koreatown: folklore, narrative and the Los Angeles riots. *Western Folklore*, 58 (2), 149–173.

Tashakkori, A. and Teddlie, C., eds. 2003. *Handbook of mixed methods in social & behavioral research*. Thousand Oaks, CA: Sage.

Tervalon, J., ed. 2002. *Geography of rage: remembering the Los Angeles riots of 1992*. Los Angeles: Really Great Books.

Tierney, K.J., 1994. Property damage and violence: a collective behavior analysis. *In*: M. Baldassare, ed. *The Los Angeles riots: lessons for the urban future*. Boulder, CO: Westview Press, 149–173.

Vernon, R.L., 1993. *L.A. justice*. Colorado Springs, CO: Focus on the Family Publishing.

Vider, S., 2004. Rethinking crown violence: self-categorization theory and the Woodstock 1999 riot. *Journal for the Theory of Social Behavior*, 34 (2), 141–165.

Webster, W.H. and Williams, H., 1992a. *The city in crisis: a report by the special advisor to the board of police commissioners on the civil disorder in Los Angeles*. Los Angeles: Special Advisor William H. Webster and Deputy Special Advisor Hubert Williams.

Webster, W.H. and Williams, H., 1992b. *The city in crisis: a report by the special advisor to the board of police commissioners on the civil disorder in Los Angeles (appendices)*. Los Angeles: Special Advisor William H. Webster and Deputy Special Advisor Hubert Williams.

Wood, D., 1992. *The power of maps*. New York: The Guilford Press.

Young, E., 1992. No title. *Los Angeles Times*, 3 May, p. 13a.