Sociology of Disasters

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Introduction

There is no such thing as a natural disaster. Not only is that phrase in the title of an influential volume published in the aftermath of Hurricane Katrina (Hartman & Squires, 2006), it has also long served as a rallying cry among social scientists who strive to focus attention on the social processes that turn natural hazards into human disasters (Hewitt, 1983; O'Keefe et al., 1976; Tierney, 2014). As Olson (2018) argues, the problem is that the term "natural disaster" puts the emphasis on the word natural, subtly shifting the responsibility for disaster losses away from their historical, economic, and political root causes. Bullard (2008:757) writes that "what many people often call 'natural' disasters are in fact acts of social injustice perpetuated by government and business on the poor, people of color, the disabled, the elderly, the homeless, those who are transit dependent, and non-drivers—groups least able to withstand such disasters."

Of course, forces of nature such as hurricanes, tornadoes, floods, earthquakes, heat waves, and so forth can trigger disaster. The severity of the crisis that follows, however, is not simply a function of wind speeds, rainfall amounts, ground motions, or temperature extremes. It is the *interaction* between the natural hazard, the condition of the built environment, and the status of the social structure that shapes the landscape of risk. It is also this interaction between the environment and society that influences whether a disaster will follow.

This chapter focuses on the contributions of sociologists who study the root causes and social consequences of everyday emergencies, disasters, and large-scale catastrophes. For the sake of brevity, we use the terms disaster or disasters throughout much of the chapter. We want to be clear at the outset, however, that researchers in this field tend to treat emergencies, disasters, and catastrophes as analytically distinct and socially constructed phenomena. These terms have been debated extensively (Perry & Quarantelli, 2005; Quarantelli, 1998), although there is general agreement that they are associated with differences in the spatial scope of an event, the seriousness of impacts to human and other environments, the entities who respond and how, the level of public participation in providing

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assistance, and the degree of recovery challenges that follow (Tierney, 2019:5–6). Further, what gets viewed as a disaster arises from "a contested terrain in which various actors. . . make assertions about events and hope their definitions of those events prevail" (Webb, 2018:114). Indeed, what gets defined as a disaster by researchers is as much a consequence of how disciplinary culture has come to conceptualize such harm as it is a consequence of how our broader culture does or does not respond.

For our purposes here, an *emergency* is defined as a narrow-scope incident such as a house fire, vehicle accident, or limited hazardous material release. Fire departments, police departments, emergency medical services, and other public sector agencies are trained to handle these smaller-scale and more easily contained events, and therefore the public is typically not involved significantly in the response. Recovery times may vary for individuals, but the longer-term impact of emergencies on communities is typically minimal (Quarantelli, 1996, 2008; Tierney, 2019).

A *disaster* is an event in which societies or their larger subunits (such as communities or regions) incur damages, losses, and disruption of their routine functioning. A disaster is observable, although may not necessarily be concentrated in time and space. Members of the public and formal emergency response agencies converge to help disaster survivors, and some individual autonomy may be lost given the emphasis on community needs. Major recovery challenges tend to follow (Fritz, 1961; Kreps, 1984; Quarantelli, 2008; Tierney, 2019).

A *catastrophe* has a large scope of impact that can affect multiple communities, states, or nations. Such events produce high levels of physical damage and social disruption, which sharply and concurrently interrupts essential services. The challenges of response tend to exceed those envisioned in disaster plans, and the broad scale of impact impairs each community's emergency response system, limits extra-community support, and often necessitates a central government response because localities and entire regions are devastated. Large-scale evacuation and long-term displacement or exodus from affected areas is possible. Massive and socially uneven recovery challenges often affect people and geographic regions for years or even decades after the initial event (Clarke, 2002; Kroll-Smith, 2018; Kroll-Smith et al., 2015; Perry & Lindell, 2007; Quarantelli, 2008; Tierney, 2019; Wachtendorf et al., 2013).

The distinctions between emergencies, disasters, and catastrophes are ideal types, and therefore researchers recognize that all of the features mentioned previously do not have to be present for an event to be classified in a particular category (Wachtendorf et al., 2013). Consider, for example, the COVID-19 global pandemic. It would certainly be classified as a catastrophe based on the scope of impact, number of lives lost, and enormous social and economic disruption caused globally, even though the pandemic has led to negligible physical damage to the built environment.

To date, most of the available sociological research has focused on disasters or large-scale catastrophes (Peek, Champeau, et al., 2020a) and this, too, is where we draw many of the case study examples that are highlighted throughout. We organize the remainder of the chapter into four sections that describe *why* sociologists study disasters, *what* this work has revealed regarding human and organizational behavior during times of collective upheaval, *how* disasters both reflect the existing social order and may forever alter it, and *where* the field might be heading in the future.

We build upon—and encourage readers to consult—overviews of the field that have previously been published in the *Annual Review of Sociology* (Arcaya et al., 2020; Kreps, 1984; Quarantelli & Dynes, 1977; Tierney, 2007), the first and second editions of the *Handbook of Disaster Research* (Rodríguez et al., 2007, 2018), and various other books, book chapters, and encyclopedia entries on the sociology of disaster and environmental sociology more broadly (Drabek, 2009, 2017; Herring, 2013; Lindell, 2013; Matthewman, 2015; Peek & Mileti, 2002; Phillips, 2015; Thomas et al., 2013; Tierney, 2014, 2019; Webb, 2007). While our primary focus is on the discipline of

sociology, we also acknowledge the key contributions of many other disciplines in the social sciences, public health and medicine, the humanities, and engineering to the multidisciplinary and increasingly interdisciplinary study of disaster (for a review of such contributions, see Peek & Guikema, 2021; Tierney, 2019). Moreover, much of the work that we cite in this chapter was produced by U.S.-based sociologists. This is due in part to the number of disasters that have affected millions of Americans over the past several decades as well as the large number of social scientists concentrated in the United States who study disasters (Peek et al., 2020a). We acknowledge, however, that there is a robust and ever-growing body of knowledge being generated by our colleagues in other contexts, and we hope that readers will consult many of the available overviews of such work (Aguirre, 2002; Britton, 1992; Danielsson et al., 2015; Miura, 2016; Okabe & Hirose, 1985; Porfiriev, 1998; Quarantelli & Yamamoto, 1982; Schorr, 1987).

Why Sociologists Study Disasters: A Brief History and Overview

Samuel Henry Prince wrote the first English language social science dissertation focused on disaster while he was a doctoral student at Columbia University. His project, *Catastrophe and Social Change,* draws on observational and interview data that he collected in the aftermath of the deadly 1917 munitions ship explosion in Halifax Harbor in Nova Scotia, Canada. His research foreshadowed many of the concepts and concerns that would eventually become central to the sociological study of disaster including, for example, the assessment of short- and longer-term impacts on survivors, mutual aid and helping behavior, the role of blame and rumors in shaping emergency response and recovery efforts, social disorganization and the re-establishment of the social order, and social change (Prince, 1920).

Although Prince's dissertation remains an influential founding document in the field, teams of social scientists did not begin systematically studying disasters in the United States until the late 1940s and early 1950s (Anderson, 2014; Tierney, 2019). Social science disaster research began in earnest during this Cold War period, when the U.S. military funded a small cadre of university-based field research teams to examine how American civilian populations would respond under conditions of extreme duress (Quarantelli, 1987). Tornadoes, fires, plane crashes, train derailments, hazardous chemical releases, and several other unexpected, acute onset emergencies and disasters served as natural experiments for the study of individual and collective behavior (Knowles, 2013). Interestingly, in the 1970s, another important stream of disaster sociology emerged in Europe with the formation of the Disaster Research Group in Sweden. Sociologists Jan Trost and Örjan Hultåker led these efforts, which were supported by the Swedish government and, as in the United States, were also funded primarily by the military (Danielsson et al., 2015).

In the U.S. context, concerns surrounding American civil defense and the impact of wartime stress remained a strong motivator for military support of disaster research, even while sociologists were keen to use disasters as occasions to understand broader sociological phenomenon (Quarantelli, 1987). Based on the questions that the U.S. military wanted to have answered, however, officials seemed to believe that people would panic in disasters, behave in aggressive ways, or become immobilized by fear. Enrico Quarantelli, who was a member of the early National Opinion Research Center (NORC) field research teams and who would become one of the early founders of the sociology of disasters, wrote that "The intent of the work was to find out how social control could be exercised by the authorities, and the assumption was made that disaster problems were primarily social psychological in nature" (Quarantelli, 1987:290).

As the number of post-disaster case studies began to mount, so too did the evidence that many of the prevailing beliefs at the time were unfounded at best and wholly inaccurate at worst. While the mass convergence of people and supplies to the scene of a disaster was framed as

a problem to be managed (Fritz & Mathewson, 1957), most of the other early studies overwhelmingly pointed to altruistic, prosocial, and highly adaptive behaviors among disaster survivors and first responders (Barton, 1969; Fritz, 1961; Merton, 1963). The early field studies provided answers to the relatively limited scope questions, and the military soon lost interest in funding the social science research teams.

Fortunately for the progression of the field, the National Academy of Sciences and the National Science Foundation picked up where the military left off. Both scientific bodies recognized the importance of the disaster setting as a strategic site for learning about social phenomena, examining social relationships and group-based patterns, and revealing social problems. Indeed, disasters offer a realistic laboratory for testing the integration, stamina, and recuperative power of large-scale social systems and communities (Fritz, 1961:654). Thus while environmental sociology grew from a recognition of societal impacts on the environment, the sociology of disaster emerged largely in response to an interest in how environmental extremes shape society. Sociologists who study disasters contend that social processes are more visible in times of disaster because they are compressed in a short time span and in a dramatic way. Pioneering scholars wrote that such events "break the cake of custom" and serve to "strip away the veil" that typically obscures social relations during less stressful times (quoted in Fothergill, 2004:26).

From the inception of the field, disaster researchers were driven by a strong curiosity and a desire to contribute to sociological knowledge by learning from collective stress situations (Anderson, 2014; Bates & Peacock, 1987; Bates & Pelanda, 1994; Britton, 1987). At the same time, the initial funding sources and applied orientation led to a heavy emphasis on acute onset disasters such as floods and tornadoes that are prevalent in the United States versus more diffuse emergencies such as famines or epidemics that occur more frequently in developing countries (Quarantelli, 1987). The pioneers recognized the need to broaden this initial emphasis, even as the study of disasters has remained heavily event driven (Dyson, 2006). Traditional typologies that focus on the commonalities and differences between various disaster agents—natural hazards, technological disasters, episodes of mass violence, and riots—gave form to this burgeoning field and are still used today (McFarlane & Norris, 2006; Peek & Sutton, 2003; Quarantelli, 1993).

Sociologists predominated in those early research teams and they strongly influenced the theoretical and methodological orientation of the nascent field (Dynes et al., 1987; Quarantelli, 1987). The much broader study of natural hazards and disasters, however, has its deepest disciplinary roots in sociology and geography (Anderson & Mattingly, 1991; Mileti, 1999; National Research Council, 2006; White & Haas, 1975). Sociologists—at least initially—focused heavily on the emergency response period while geographers historically concentrated on hazard vulnerability and hazard mitigation. In reflecting on the evolution of the field, Anderson (2014:4) observed that, "Such domain distinctions would erode in the years ahead as researchers from across the social science disciplines began to collaborate and exchange perspectives." Those disciplinary and methodological boundaries have continued to morph and expand in new directions as the field continues to grow and has become ever more integrated (Peek et al., 2020a, b).

The turn of the twenty-first century has led the social scientific and cross-disciplinary study of disasters to take on a newfound sense of urgency, due in part to a number of landmark events that have caused widespread human suffering such as the terrorist attacks of September 11, 2001, the 2004 Indian Ocean earthquake and tsunami, Hurricane Katrina in 2005, the 2010 Haiti earthquake, the 2011 triple disaster in Japan, Hurricane Maria in 2017, and the COVID-19 global pandemic. Sociologists and other social scientists who study disasters continue to use extreme events as a mirror to reflect the realities of society while also working to effect change in the social conditions that turn hazards into disasters.

What the Sociology of Disaster Has Revealed: Human Behavior in Collective Stress Situations

We have already alluded to some of the foundational contributions of sociologists who participated in initial disaster field research teams. Quarantelli (1988:305) summarized in no uncertain terms what these sociologists did, and did not, observe in the various communities researchers studied:

> Self-control is maintained in extreme threat situations. Panic or wild flight, hysterical breakdown, affective immobility are almost nonexistent... Those in danger try to help one another. Because persons are very frightened or afraid does not mean that they will fail to try and take protective actions... Passivity is not characteristic of the immediate post-impact period. The initial and by far the greatest amount of search and rescue is undertaken on the spot by survivors... Severe mental health problems are not occasioned on any scale by disasters... Convergence on a disaster site is a major problem... There may be widespread stories of looting, but actual cases of looting are very rare in post-impact situations.

As knowledge accumulated and the sociology of disasters matured as a field, sociologists began to push back more forcefully against "disaster myths" that did not accurately reflect human behavior in moments of collective stress (Fischer, 2008; Quarantelli, 2008; Quarantelli & Dynes, 1972). These myths are often rooted in public perception of human behavior in disaster, and the media and popular culture have often contributed to furthering disaster-related myths about the prevalence of panic, looting, price gouging, and other forms of antisocial behavior (Wilson, 2014). Because most people do not witness a disaster firsthand, the frames that media generate have a powerful influence over what people think happens (Kappeler & Potter, 1996; Quarantelli, 1991; Wachtendorf et al., 2015).

There are understandable reasons why media frames may not always match observed reality. Reporters are almost always working under exceptionally tight deadlines, and they tend to be unfamiliar with the fundamentals of disaster-related behavior. This issue is exacerbated because reporting conventions tend to emphasize dramatic events or unusual behaviors (Tierney et al., 2006). Moreover, social segmentation of media audiences strongly influences media messaging, which can lead to a narrow scope of representations of complex human activities (Campbell, 2010; Klinenberg, 2002).

Disaster myths are not just problematic because they are untrue—although that itself is cause for concern in this era of fake news and deeply contested scientific knowledge—but also because the transmission of misinformation can influence organizational, governmental, and public responses during disasters. This point was perhaps most tragically illustrated in Hurricane Katrina, when the news media reported unverified and deeply racialized rumors from the disaster zone regarding violence and mayhem that was purportedly taking place in the majority African American city of New Orleans (Campbell, 2010). As a consequence, life-saving resources were diverted and search and rescue efforts stalled as emergency responders were told to police the very people they were supposed to be helping (Dyson, 2006; Tierney et al., 2006). In that long pause, people died, suffered, and lost the illusion that they could depend on the good will of their city, their state, and their country. The cost in human life and human dignity was tremendous and continues to this day (Erikson & Peek, 2022).

As researchers have worked to counter such potentially deadly disaster myths, they also started to reflect more deeply upon their own narratives, and in so doing, to challenge what Tierney (2007) refers to as the "good news" frame that took hold of the field in the early decades. Disaster researchers created this frame, in part, as an empirical antidote to the disaster myths that were being reported (Tierney, 2019). But this good news frame—and the attendant focus on altruistic behavior, organizational problem-solving, and disasters as status levelers—also served to obscure important social phenomena that was revealed in later studies with a wider range of disaster settings and more diverse population groups in different cultural contexts. For example, more recent research has

identified early onset and enduring mental health challenges among some segments of the population (Fussell, 2015; Van Landingham, 2017), loss of community and increases in intergroup conflict (Erikson, 1976), increased levels of interpersonal violence against women (Enarson, 2012; Fothergill, 2004), educational disparities among children (Fothergill & Peek, 2015), backlash and discrimination against communities of color (Peek, 2011; Peek & Meyer, 2016; Rivera & Miller, 2007), and a deepening of economic inequality (Dash et al., 1997; Howell & Elliott, 2019; Peacock et al., 1997; Siders, 2019; Tierney, 2014).

Disasters clearly bring "bad news" as well as "good news." But the question still remains: How do humans actually behave in disasters? There is, of course, no simple answer. Human beings are as complex as they are diverse. Their behavior and how they are impacted by disaster is influenced by countless situational, demographic, environmental, political, economic, cultural, social, and other variables. What we see as researchers is also shaped by our own social and cultural positions and theoretical lenses. Early disaster researchers were often working from a structural functionalist or symbolic interactionist frame (Barton, 1969; Fritz, 1961; Quarantelli & Dynes, 1977); more recent generations of researchers have drawn from a more robust theoretical toolkit and have increasingly used conflict theory, critical race theory, feminist theory, or an intersectional lens in the study of disasters (Enarson et al., 2018; Freudenburg et al., 2009; Luft, 2012; Penta et al., 2019; Stallings, 2002; Tierney, 1999).

The disaster context and the time frame being studied matters, as well. Consider, for example, the meta-review conducted by Norris et al. (2002) that assessed the psychological harm experienced by 60,000 disaster survivors. Their work revealed that those who experienced episodes of mass violence, such as terrorism, were more impacted than survivors of natural hazards or technological disasters. It is worth noting, however, that the severity of exposure and the scale of destruction and disruption mattered as much, if not more, than the precipitating disaster agent. They also found that children suffered more severe psychological impacts than adults and that people in the developing world were more adversely affected than those in wealthier countries. Among the adult samples assessed, being female, middle aged, or a member of a racial or ethnic minority group; having other life stressors; and/or having a history of mental illness were all linked to more severe mental health consequences. While most disaster survivors in the analysis did not develop long-term mental health issues, some did, and that has led to calls for more robust interventions after disaster and more longitudinal disaster research (Fothergill & Peek, 2015; Kroll-Smith, 2018; Kroll-Smith et al., 2015; Picou & Nicholls, 2019).

It is difficult to characterize human behavior and disaster impacts, but part of our primary responsibility as sociologists is to identify patterns. In that quest, we find it useful to ask the following types of questions: How do diverse groups of human beings behave before, during, and after disaster? What personal, environmental, and structural factors influence the behavior or outcome in question? Does the behavior or outcome hold across cultures and contexts? How and why does human behavior vary? We raise these questions not to challenge the existing body of research, but rather to honor the diversity and intricacy of human response to disasters in a rapidly evolving world that is increasingly punctuated by more intense and severe disasters.

In that spirit, we now turn to a brief review of available evidence regarding three enduring areas of study on human behavior in disaster—convergence behavior, panic and prosocial behavior, and crime and conflict. It is important to emphasize that the sociology of disasters extends well beyond these three areas. Our purpose here, though, is to use these examples to illustrate the power of sociology in revealing social processes and group-based patterns, while also shedding light on the complicated, sometimes contradictory, and ever-expanding body of knowledge that characterizes the sociological study of disaster.

Convergence Behavior

With the support of the National Academy of Sciences, Fritz and Mathewson (1957) published the first comprehensive report on convergence behavior in disasters. They defined convergence as the "mass movement of people, messages, and supplies toward the disaster struck area" (p. 1). Fritz and Mathewson (1957) were especially focused on understanding how to control these forms of personal, informational, and materiel convergence at the scene of a disaster. They characterized the convergence of people and supplies as a social problem to be studied and as a disaster planning and management problem to be solved.

Their initial report and the additional work of other members of the pioneering field research teams spurred generations of research on convergence behavior in the context of natural hazards, terrorist attacks, humanitarian emergencies, and various other disasters (for a recent review and theoretical statement, see Penta et al., 2019). Moreover, researchers have offered various typologies to delineate the personal characteristics and behavioral motivations of "informal and unofficial convergers" (Fritz & Mathewson, 1957:29). These are the people who may physically move toward the epicenter of a disaster, move toward other areas associated with the disaster response milieu, or engage in actions that otherwise contribute to post-disaster convergence (Kendra & Wachtendorf, 2003; Scanlon, 1991) (see Table 11.1).

Research on convergence behavior in disasters now spans many decades, and some of the most recent work has expanded our understanding of these categories. For example, Subba and Bui (2010, 2017) have identified *detectives* as helper convergers, who by performing surveillance activity—either in person or online—enhance information management among authorities and the private sector. Their purpose is to serve and protect the public, to deter criminal behavior, and to report on or respond to suspicious activity. Others have taken a close look at *researchers* themselves as convergers who might constitute a form of the curious (Gaillard & Gomez, 2015; Gaillard & Peek, 2019; Kelman, 2005). Researcher convergence is especially likely in the case of large-scale disasters, where individual researchers and research teams from many different disciplines and geographic locations often travel to the disaster zone to collect perishable data (Gaillard & Peek, 2019; Peek, Tobin, et al., 2020b). The curious can also include journalists, dignitaries, and celebrities (Kendra & Wachtendorf, 2003). In all cases, it is important to note that a person might occupy more than one convergence category or move between them.

Beyond the work that we have cited here, there are many dozens if not hundreds of other reports, journal articles, book chapters, and books on the topic of post-disaster convergence. This research has verified Fritz and Mathewson's early assertion that convergence is a "virtually universal phenomenon following disasters" (1957:1). It has also helped to extend their initial typology to more carefully consider both the problems and possibilities associated with convergence.

Consider, for example, that certain types of convergence continue to be described in the literature as social problems to be studied and solved—this is especially true of materiel convergence, or the convergence of supplies, donations, and equipment, which can create massive and long-term logistical problems in disaster affected areas (Holguín-Veras et al., 2007, 2012; Neal, 1994; Penta et al., 2019; Wachtendorf et al., 2013). Years after the 2011 Joplin tornado, for instance, the school district had to continue to use staff to sort through the countless donations and supplies that were shipped to the city after the disaster. But other forms of convergence behavior have been carefully recast as legitimate, even vital, to disaster response and recovery efforts (Kendra & Wachtendorf, 2003). Survivors who converge after disaster rescue other survivors (Barsky et al., 2007; Kendra & Wachtendorf, 2016; Meyer et al., 2020). The supporters, mourners, and memorializers who converge encourage emergency responders, assist survivors, and contribute to the emergency response and healing of others (Kendra &

Table 11.1 A typology of disaster convergence behaviors

Typology of Disaster Convergers	Brief Definition and Description of Motivations	Source
The returnees	Disaster survivors who have evacuated from the disaster area and return to assess losses and retrieve, guard, or salvage property from their residences, schools, or businesses. They may also be motivated by a desire for a permanent return to place.	Fritz & Mathewson, (1957, p. 30)
The anxious	People, such as separated nuclear and extended family members or members of friendship groups, who have close ties with those in the disaster zone and are actively seeking out information about affected loved ones.	Fritz & Mathewson, (1957, p. 36–37)
The helpers	Spontaneous, informal, often uncoordinated volunteers from inside or outside the disaster zone who try to bolster the efforts of formal response and relief organizations. This category also may include formal emergency responders and those who are affiliated with established organizations or groups and choose to self-deploy to the disaster zone.	Fritz & Mathewson, (1957, p. 40–41); Kendra & Wachtendorf, (2003)
The curious	People who are typically detached from the immediate personal danger of the disaster and the overriding concerns for the safety and welfare of other people. They converge because the disaster itself—an unusual and dramatic event—has excited their attention.	Fritz & Mathewson, (1957, p. 46–47)
The exploiters	People who seek private gain from the public misfortune caused by disaster. Exploitation, although relatively rare, may come in various forms such as looting, price gouging, or otherwise taking advantage of disaster-stricken people and places.	Fritz & Mathewson, (1957, p. 50)
The supporters	People who come to show their gratitude for and solidarity with survivors, emergency responders, and other rescue and relief workers.	Kendra & Wachtendorf, (2003)
The mourners and memorializers	People who come to commemorate or remember those who have perished in the disaster or to recognize those have sacrificed to help victims and survivors.	Kendra & Wachtendorf, (2003)

Wachtendorf, 2016; Steffen & Fothergill, 2009). Research in the area of post-disaster convergence has helped to paint a more textured portrait of human behavior in disaster, showing how the movement of people, information, and goods can both help and harm during the height of an emergency.

Panic and Prosocial Behavior

One of the most common, and longstanding, misconceptions about human behavior in disaster is that people will panic. The reality is that panic, or a state of confusion triggering unreasonable behavior, is rare in disaster, but many otherwise understandable behaviors can be labeled as panic (Fischer, 2008). For instance, some people who are not actually facing an impending threat, such as a hurricane landfall, might still choose to evacuate in an effort to move out of harm's way (Dash & Gladwin, 2007). Similarly, when the COVID-19 pandemic took root and began to spread across the United States, people were roundly criticized for "panic buying" groceries and other household goods rather than being recognized for their attempts to prepare in the face of a historic crisis (Wachtendorf, 2020). These examples, by definition, are not indicative of panic but instead are normal reactions to perceived danger and uncertainty. In fact, running away from threats is typically an advisable protective response, although in disasters such behaviors are often derisively referred to as panic (Clarke, 2002).

Issues arise when officials believe the panic myth. This can cause them to delay issuing warnings or to otherwise withhold vital risk information from the public (Drury et al., 2013; Nogami, 2018). Moreover, the focus on individual behavior and the potential for panic can shift critical attention away from more systemic failures that can actually generate catastrophe (Wachtendorf, 2020).

Decades of research has shown that during the immediate crisis period, people do not typically panic, nor do they descend into a state of shock and helplessness. The much more common behavioral response is for those in the path of harm to help one another as summarized here:

> In the wake of disaster, most people experience a newfound sense of urgency, purpose, and solidarity. Indeed, the earliest disaster researchers were so struck by the high levels of empathy and mutual helpfulness that they observed following catastrophic acts of nature, they used such terms as "altruistic community" and "therapeutic social system" to depict the heightened sense of camaraderie. These communities of compassion and care play an important role after disaster: They can lead to improved psychological functioning among traumatized victims and may even impel the entire disaster-stricken population toward a state of recovery (Peek, 2011:176).

Such altruistic or prosocial behavior can take many different forms during and in the immediate aftermath of disaster. Neighbors and friends provide shelter, supplies, and financial support through their social networks (Aldrich & Meyer, 2015; Meyer, 2018). People often line up at blood donation stations and philanthropic giving tends to surge (Meyer et al., 2020). Children and adults may organize donation drives or fundraisers to help fulfill unmet needs (Fothergill, 2004; Peek, 2008). And spontaneous volunteerism almost always occurs as people try to serve others during times of great loss and upheaval (Kendra & Wachtendorf, 2016; Lowe & Fothergill, 2003; Steffen & Fothergill, 2009; Wenger & James, 1991).

Following Hurricane Katrina, Rodríguez et al. (2006:82) concluded that prosocial behavior "was by far the primary response" to the catastrophe. Researchers who were located in the affected regions and those who traveled to New Orleans and the Gulf Coast after the storm shared countless observations of how family members were helping each other, friends were joining together, and strangers were offering mutual aid and support in the time of Katrina. A small sampling of such stories from the field, follows:

> A 51-year-old woman, badly injured before Katrina, was stuck with no way out of the city as the hurricane advanced. Her daughter-in-law came by to check on her, and she promised the ailing woman, "I'm not going to leave you... because I know you're here by yourself and you don't have any way to get out... So we're either going to get out or we're going to be here together" (Mason, 2012:186).

> A 12-year-old boy placed his 4-year-old brother, his grandmother, and his wheelchair-bound uncle onto a mattress and floated them out the window to a house with a second story when the floodwaters from Katrina got too high (Kirschke & Van Vliet, 2005:389).

> Appalled by the conditions just outside the Superdome and fearing what was occurring inside, two parents and their five children stayed on an interstate bridge for five days after Katrina. They joined forces with a neighboring family, looking out for one another and foraging for food and water when their meager supplies ran out (Lein et al., 2012:50).

> The New Orleans Convention Center, without any planning, became a makeshift shelter for thousands of people. When everyone was finally evacuated from the facility, the chairs left behind were arranged in hundreds of small circles—people had, on their own, formed up into small groups of families and friends, protecting each other (Quigley, 2008:377).

Examples like these could stretch on for many pages. The point to be made here is that most credible research and reliable journalistic accounts emphasize that Katrina survivors did just what generations of disaster victims had done before them. They looked out for and cared for each other. They improvised and made clever use of the scarce resources available to

them. They were heroic in many ways as they sacrificed in the face of grave danger. This is what sociologists mean when we refer to prosocial behavior in disaster and it is worth emphasizing how often this occurs in the immediate term aftermath of crises of all different kinds.

Crime and Conflict

The mortar that holds human communities together is made up, at least in part, of a sense of trust, respect, decency, and, in moments of emergency, of charity and concern. But disasters, as previously mentioned, may also become sites of conflict and social division. When and under what conditions certain types of crime, violent victimization, and other forms of antisocial behavior occurs has been a longstanding focus of sociologists who study disasters.

Although looting is often framed by the media and in popular culture as a common criminal occurrence in disaster, it is actually highly unusual (Green, 2006). When looting has happened in U.S. disasters, it is almost always carried out in secret, involves isolated individuals or small groups rather than large numbers of people, and is widely condemned by affected residents (McEntire et al., 2003; Tierney et al., 2006). In instances where widespread looting has been documented, such as in St. Croix after Hurricane Hugo in 1989, the following conditions influenced the observed behavior: dramatic disparities between the rich and poor, high levels of pre-existing petty crime and gang activity, ineffective and corrupt police agencies, and a catastrophe that caused massive destruction with little hope for the quick arrival of humanitarian aid (Quarantelli, 2008).

Beyond looting, most crime and disaster literature has historically focused on a limited range of behaviors such as price gouging or property crime that might be perpetrated during the impact and emergency phases of disasters. This narrow emphasis has resulted in a divide in the research literature. Those in one camp contend that disasters strengthen norms of reciprocity and altruism and leads to a reduction or stabilization in crime rates. Those in the other camp argue that disasters weaken the mechanisms of formal and informal social control, giving rise to opportunities to commit crime and increased rates of unlawful behavior (see Zahran et al., 2009) including activities associated with white-collar crimes (Aguirre & Lane, 2019).

In a series of edited volumes on the topic, Harper and Frailing (2010, 2012, 2015) have helped to bridge the divide by drawing together contributions that consider a wider range of criminal behavior that can occur in the immediate and longer-term aftermath of disaster. The chapter authors explore the conditions that drive various criminogenic effects of disaster and use diverse data sources to examine instances of rape, domestic violence, homicide, hate crime, illegal drug use, and fraud that have occurred at varying rates after different disaster types. Contributors also explore what happens to people and communities when the disaster itself is a crime, such as was the case in the Exxon Valdez Oil Spill and the BP Oil Spill (Gill et al., 2016). In 9/11, the principal crime—the terrorist attacks—prompted cascading criminal activity in the form of retaliatory hate crimes that were leveled against Muslims, Arabs, and members of other religious and ethnic minority groups (Peek, 2011; Peek & Meyer, 2016).

Sociologists have made important connections between mass incarceration and disaster management activities, as well. This line of research describes how the criminal justice system, which unequally targets low-income communities of color, is used to expand emergency management capacity during times of disaster (Purdum, 2019; Purdum & Meyer, 2020). For example, Goodman (2014) shows how inmates are regularly placed in harm's way when they are forced to fight wildland fires. Scholars have also posited that mass Black death is an ongoing disaster, a form of violence against Black bodies rooted in the very systems that sometimes purport to protect communities (Henry, 2020a).

As the study of crime, victimization, and disaster has expanded in new directions over the years, so too has the exploration of why communities break down in certain disaster

situations. This research often draws on conflict theory and has moved the field more squarely into the study of technological disaster and chronic environmental hazards. In a now classic work, Erikson (1976) examined the loss of communality that followed the 1972 Buffalo Creek dam collapse and resulting flood. The community, which was a company mining town, became embroiled in extensive litigation, and the surviving residents were moved to higher ground and away from the floodplain. The officials who relocated the community did so, however, without consideration of pre-existing family and social formations that were the invisible bonds that held Buffalo Creek together before the disaster.

Later work in this same vein demonstrates that the disaster agent itself can predict whether community consensus or conflict is observed (Erikson, 1994). Chronic crises involving clear human culpability are more likely than those perceived as purely acts of nature to result in a "corrosive community" response (Cope et al., 2016, 2020; Parks et al., 2020; Couch & Kroll-Smith, 1985, 1991). Civil disturbances (Hewitt 1997; Warheit, 1976), riots (Quarantelli, 1993), terrorist attacks (Peek & Sutton, 2003), and technological disasters (Couch & Kroll-Smith, 1985, 1991; Kroll-Smith & Couch, 1990; Neal, 1984) are especially likely to lead to conflict, blame attribution, and protracted litigation that can create or deepen already existing fault lines in communities (Mayer et al., 2015; Picou et al., 2004). Natural hazard events that generate technological failures and cascading, complex disasters, such as Hurricane Katrina, can also lead to prolonged recovery processes among marginalized populations and corrosive community responses (Laska et al., 2018; Mohammad & Peek, 2019; Parks et al., 2020).

How Disasters Reflect the Existing Social Order: Social Inequality and Group-Based Patterns

Disasters do not cause indiscriminate harm, and while they may involve forces of nature, they are not external to our social systems. This recognition has not only spurred sociologists to challenge notions of "natural" disasters. It has also led to a vitally important body of scholarship that clearly documents what Matthewman (2015:13) refers to as "vastly uneven landscapes of risk."

Social scientists from a range of disciplines have found that disaster risk, like other forms of environmental injustice, is patterned in ways that reflect pre-existing social and economic inequalities. Groups that are marginalized have less power and fewer resources, and in turn, they often have the hardest time preparing for, responding to, and recovering from disaster (Hewitt 1997; Wisner et al., 2004). This means that disaster losses tend to be distributed along the familiar lines of race, ethnicity, gender, social class, and age (Peacock et al., 1997; Phillips et al., 2010; Thomas et al., 2013). It also means that public and private sector regulation of risk—or lack thereof—can reproduce and create inequality (Giritli Nygren et al., 2017; Montelius & Giritli Nygren, 2014; Petridou et al., 2019).

The patterns that disasters both reveal and reinforce are apparent in who lives and who dies in a disaster event. A recent global report showed that, of the 1.3 million people killed in natural hazards events in the past 20 years, people in the world's poorest nations were more than seven times more likely to die than equivalent populations in the richest nations (Wallemacq & House, 2018). The United States and other high-income countries have dramatically reduced overall disaster mortality, largely due to enhanced building codes and standards, stronger government enforcement of mitigation policies, advanced early warning systems, and other interventions. Still, when disasters have caused large loss of life in the United States—including in the still unfolding COVID-19 pandemic—those at the margins of society have suffered disproportionately. Other recent examples include Hurricane Maria in 2017, Hurricane Katrina in 2005, and the Chicago Heat Wave in 1995. These events resulted in higher death rates among the elderly, people with pre-existing medical conditions, low-income people, those with limited social networks, and people of color

(Klinenberg, 2002; Santos-Burgoa et al. 2018; Sharkey, 2007).

In the first comprehensive examination of children's mortality from forces of nature in the United States, Zahran et al. (2008) discovered that while children's overall risk of death is relatively low, differential risks exist depending on the hazard agent and the demographic characteristics of the child. Their analyses of the Centers for Disease Control and Prevention's WONDER database revealed that risk of death among youth cohorts ages 0–24 is highest for infants and the death rate for male children is higher than the death rate for female children. Data on race indicate that African American male children between the ages of 0–4 are most at risk for death by disaster, while White male children between the ages of 5–24 are most at risk. In terms of risk by age by hazard type, their analyses revealed that infants and very young children age 0–4 are most likely to die of exposure to extreme heat, 5–14 year-olds are most likely to die in cataclysmic storms and flood events, and youth ages 15–24 are most likely to die of excessive cold.

Adams et al. (2020), also drawing on the CDC WONDER database, conducted similar analyses to examine disaster mortality patterns among older adults (60+ years) in the United States. They found that older adults have a 3.84-fold increase in mortality caused by natural hazards compared to those under age 60. Among older adults, males have higher mortality rates than females. American Indians/Alaska Natives have the highest mortality rate of any racial/ethnic group and are particularly impacted by excessive cold. Mortality is also high among Black males, especially in the context of cataclysmic storms. Differences in mortality rates among racial/ethnic groups widen with age.

While we have focused on disparate patterns in terms of disaster-related mortality, group-based inequalities are apparent across the disaster lifecycle (Mileti, 1999). Sociological research has repeatedly shown that those who are at the margins of society almost always have a harder time preparing for disaster and, in turn, suffer more severe physical and mental health outcomes, are more likely to be displaced, and are more likely to experience protracted and uneven recovery processes (Arcaya et al., 2020).

Sociologists have always played a central role in identifying disaster-related disparities among particular groups of people (Elliott, 2015; Elliott & Pais, 2006; Enarson, 2012; Howell & Elliott, 2019; Luft, 2016). Of course, many of these unequal and negative *post-disaster outcomes* are shaped by the *pre-disaster circumstances* of the groups in question. Consider the following examples from the social science literature that illustrate the power of pre-disaster context in shaping post-disaster outcomes (adapted from Peek & Domingue, 2020:67–68, Table 5.1):

- *Poverty:* People in poverty or near-poverty are more likely to experience bouts of homelessness and to live in the most vulnerable housing (Vickery, 2017). The poor and near poor tend to lack the resources necessary to relocate or to retrofit their dwellings, especially when they are renters. Even though they may have higher risk perceptions, they are less likely to receive warning messages and to be able to act appropriately to the messages they do receive (Dash 2013; Peacock et al., 1987). The poor are less likely to apply for and receive post-disaster recovery aid, and policies that are ostensibly meant to spur recovery may actually deepen the wealth gap (Fothergill & Peek, 2004; Howell & Elliott, 2019).
- *Race and Ethnicity:* African Americans, Latinos, Native Americans, Asian Americans, and other communities of color in the United States have been subjected to overtly racist and discriminatory policies that have institutionalized their exclusion and segregation and led to the denial of various rights and opportunities. Formal policies and the informal practices associated with race and ethnicity have resulted in centuries of unequal allocation of resources, as well as present-day racial disparities that influence the harm of disasters (Fothergill et al., 1999; Peacock et al., 1997, 2014). Recent research demonstrates the difficulty communities of color experience even as they mobilize to

overcome deeply entrenched inequalities (Rivera et al., 2015; Santos-Hernández, 2006), as they continue to face unjust recovery policies (Gotham, 2014; Hamideh, 2020).

- *Gender:* Gender roles, expectations, and norms often lead to differential vulnerability between men and women (Alston & Kent, 2008; Fothergill, 2004; Haney & Gray-Scholz, 2019; Houghton, 2009; Hyndman, 2008; Parkinson & Zara, 2016; Tobin-Gurley & Enarson, 2013). In most places around the world, women are less likely to have political representation proportionate to their share of the population, sustain financial and social independence, and earn wages and salaries commensurate with their male counterparts (Enarson, 2012). In turn, women and girls are more likely to experience violence and abuse, be politically and socially marginalized and economically exploited, to live in poverty, and to be ignored or excluded in decision-making processes (Enarson et al., 2018; Jenkins & Phillips, 2008; Villarreal & Meyer, 2020).
- *Age - Older Adults:* Older persons may be more susceptible to harm and suffering in disaster under certain conditions, such as when they experience physical or medical conditions that limit their mobility, depend on devices or medical treatments that require power or access to prescription medications, have physical disabilities that limit their ability to receive warnings or take necessary protective actions, have fewer social connections or smaller social networks, and lack access to the Internet, a computer, or other resources necessary to apply for and receive pre- or post-disaster aid (Campbell, 2019; Klinenberg, 2002; Meyer, 2016; Peek, 2013).
- *Age - Children and Youth:* For children and youth, their vulnerability is influenced by their age as well as other factors such as family structure; exclusion from the public sphere and decision-making bodies that influence them; lack of voting rights; cultural systems that devalue their perspectives and ignore their voices; stigma or stereotypes against young people; and high rates of child poverty (Anderson, 2005; Fothergill, 2017; Fothergill & Peek, 2015; McDonald-Harker et al., 2020; Peek, 2008; Peek et al., 2018).

Sociologists have also made important contributions in identifying how occupational status (Adams & Anderson, 2019) and particular institutions such as the family, schools, government, religion, the healthcare system, and the economy shape the *context* in which people live and work, which in turn, influences the risks that they face (Phillips, 2015). Often, disasters are the predictable outcome of years if not generations of short-sighted decision-making, typically motivated by profit-seeking or a focus on other forms of political or economic gain, that translate into environmental degradation, poor land use planning, and other unsustainable development practices. These contribute to what Mileti (1999) calls "disasters by design," which leave entire groups of people unprotected from the various shocks and setbacks that accompany disasters.

The Future of the Field: Disaster Sociology for a More Turbulent and Unequal World

Disaster losses are on the rise globally. According to recent analyses of data from the Emergency Events Database (EM-DAT) maintained by the Centre for Research on the Epidemiology of Disasters (CRED), in the span from 1998 to 2017, countries experiencing natural hazards that became disasters reported $2.9 trillion in economic losses (Wallemacq & House, 2018). Due to higher asset values, the United States alone accounted for about one-third, or approximately $945 billion, of worldwide losses in the study period. Although high-income countries bear the brunt of absolute economic losses in disasters, low- to middle-income countries suffer disproportionate losses that can erase decades of development progress (Wallemacq & House, 2018).

Economic indicators obviously represent just one measure of the mounting toll of disasters. The same report found that during the period from 1998–2017, 1.3 million people died in disasters and 4.4 billion were injured, rendered homeless, displaced, or left in need of emergency assistance (Wallemacq & House, 2018). Sociological research has helped reveal the root causes of such disaster losses and has identified many additional personal and collective consequences. Indeed, research in the sociology of disasters provides an important window into the harm and suffering caused by disasters, as it reveals the complicated interconnection between environmental conditions and social processes and systems. This work has advanced our understanding of human behavior during times of immediate crisis. It has also focused attention on the role of rising social and economic inequality, environmental degradation, mounting population pressures and unsustainable development in hazard-prone areas, climate change, and other environmental and social forces that collide to ultimately create catastrophe.

The twentieth century gave rise to both disaster sociology in the 1940s and 1950s and environmental sociology in the 1970s. The losses already incurred in the twenty-first century have demonstrated repeatedly how vital these areas of study are and how necessary it is to respond to recent calls to better integrate disaster studies with the sociology of climate change, the intersectional study of environmental injustice, and environmental sociology more broadly (Dunlap & Brulle, 2015; Malin & Ryder, 2018; Ryder, 2017; Tierney, 2007).

Wachtendorf (2019) has encouraged bold action among the disaster research community, challenging us to rethink the field and organize ourselves around the grand challenges that we now face. We believe that it is possible to respond to this call through adopting a *convergence research framework*—here defined as an approach to knowledge production and action that involves diverse teams working together in novel ways, transcending disciplinary and organizational boundaries, to address vexing social, economic, environmental, and technical challenges in an effort to reduce disaster losses and promote collective well-being (Peek, Tobin, et al., 2020b:2). This framework, which is problem-focused and solutions-oriented, can help mobilize researchers and practitioners to respond to the many urgent environmental and social challenges that confront humanity and especially the world's poorest and most marginalized people (also see Prasad, 2018). To move in this direction, we conclude with the following ideas that we would like to see advanced in the sociology of disaster over the coming decade.

First, disaster sociologists need to take a central role in interdisciplinary and transdisciplinary teams that are converging to study and respond to society's grand challenges. At present, most convergence research efforts (and here again, we are referring to a distinct approach to *doing research*) that are focused on major environmental problems are led by engineers, biomedical scientists, and others from traditional STEM disciplines. The social and behavioral sciences, as well as the humanities, have been largely excluded from the convergence revolution that has taken root in this century (Peek et al., 2020b). This is problematic because there is a strong chance, based on historical precedent, that these teams could move forth in issuing technical fixes for what are actually social problems (ibid:4). Sociologists and other social scientists should help lead the convergence revolution so that we can broaden the horizons of scientific inquiry and respond most effectively to increasingly complex environmental and social challenges.

Second, ethical considerations should be centered alongside our research questions and given the same primacy. We take a broad and inclusive approach to research ethics, moving beyond institutional review board requirements to think deeply about the rights and obligations of researchers to one another, as well as to those whom we study (Browne & Peek, 2014). This means that as the field progresses, it is crucial that the rights and interests of researchers (Kendra & Gregory, 2019) and research participants (Gaillard & Peek, 2019) are equally respected

and protected. This will help ensure that evermore critical and lifesaving disaster research can continue unimpeded by overly bureaucratic restrictions (Kendra & Gregory, 2019). At the same time, researchers should engage in their work by centering ethics and respecting the dignity of their participants, even when they must sometimes simultaneously identify actions and beliefs of participants that contribute to systemic inequalities and social vulnerability. While there are limitations in relying solely on people's own personal experiences, the same can be said of relying only on numerical data (Perez, 2019). The key, according to Perez (2020), is to figure out where the two can meet and inform each other in ways that actually work to improve the lives of those most impacted by disaster and injustice. This assertion is as true in disaster sociology as it is in the discipline more broadly. Greater use of participatory engagement practices can be one effective way to better address the complex needs and desires of the people whom we study (Hendricks et al., 2018; Meyer et al., 2020).

Third, disaster sociology should focus on the possibility for disaster justice in the twenty-first century. We believe such a shift could strengthen the ties to environmental sociology more broadly and studies of environmental justice specifically (Mohai et al., 2009; Pellow & Nyseth Brehm, 2013), advancing stronger theoretical and applied frameworks. Long-understood inequitable disaster impacts based on race, ethnicity, income, gender, and other facets of social stratification should be aligned with the theoretical lineage of environmental justice and climate justice literatures (Perez & Egan, 2016; Ryder, 2017). Taylor (2014), for example, centers the processes of historical and ongoing racial and economic marginalization that generate environmental injustices around toxic exposures. These same processes, such as discriminatory redlining practices that relegated African American neighborhoods to flood-prone areas and what have now become urban heat islands, can result in disaster injustices. Similarly, strategies to contend with the potential impact of climate change can generate inequities in implementation, outcomes, and benefits (Mach et al., 2019; Siders, 2019). Environmental sociology and the sociology of climate change have furthered our theoretical understanding of development, urbanization, and capitalism in ways that intersect directly with disaster. When the powerful insights of these different areas merge, we see the possibility not just for exposing the roots of environmental harms, but also for illuminating a more just and sustainable future.

Fourth, we call on disaster sociologists to focus on the strengths and capacities of the people whom they study. Sociologists have pointed out that those affected by disaster are not just "helpless victims" waiting to be saved (Fothergill & Peek, 2015:4). Children and adults also have enormous strengths and capacities that can transform disaster preparedness, response, and recovery efforts (Peek, 2008; Rivera et al., 2015). Even with that frame in mind, sociologists continue to focus overwhelmingly on disaster-related disparities and inequities. This is understandable given our training to look for patterns in society, and anyone who looks carefully can clearly see that the already disadvantaged often suffer first and worst in disasters. But there are also other local and global patterns emerging. This includes the mobilization of the poor, people of color, children, and other groups that have been historically marginalized who are rising up in response to the risks they face. Sociologists should investigate these patterns of progress and action in areas of risk just as diligently as we study disaster-related disadvantages.

Fifth, there needs to be a major investment in promoting public disaster sociology alongside a public environmental sociology (see Caniglia et al., 2021, this volume). From the earliest days of disaster sociology, researchers have been driven by the desire to make contributions both to knowledge as well as to practice. Sustained engagement by sociologists, working with personnel from emergency management agencies and non-governmental organizations, disseminating findings in non-academic forums and through newspaper op-eds, and making calls over the decades to continue to bridge the gap between researchers and practitioners are examples of such outcomes of this motivation.

Yet many of these efforts have been ad hoc or on an individual level.

Research shows large gaps and potential opportunities for furthering the integration of disaster research into practice (Fothergill, 2000; Williams & Webb, 2019). This means that investments in formal institutional mechanisms and funding for public disaster sociology and public environmental sociology training programs for researchers at all career stages are crucial. Such programs could help researchers learn how to *translate* what they already know to broader media, policy, and practitioner audiences. Greater emphasis on open-access publications (such as Laska, 2020) and continuing the legacy of readily available white papers and other online publications such as those from the Disaster Research Center at the University of Delaware, the Hazard Reduction & Recovery Center at Texas A&M University, the Natural Hazards Center at the University of Colorado Boulder, and the many other academic hazards and disaster research centers that now exist globally can help continue to democratize access to knowledge (see Hines et al., 2020). Moreover, taking advantage of novel, diverse, and accessible dissemination methods such as social media, blogs, podcasts, videos, training modules, and other mediums can help expand the reach of research. As the speed at which information is produced and consumed has evolved in the twenty-first century, so too have the actions of researchers as they increasingly combine their activism and advocacy in ways that transform disaster scholarship (Henry, 2020b).

While disaster sociology is an ever-evolving field, we have a tremendous legacy of information that can and should be applied to ensure that our policies do not lead to a deepening of inequality and disadvantage the already disadvantaged. Sharing the enduring lessons of this field, while focusing anew on twenty-first century challenges, offers great promise and possibility for more just and equitable futures.

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References

Adams, R. M., Evans, C. M., Mathews, M., Wolkin, A., & Peek, L. (2020). Mortality from forces of nature among older adults by race/ethnicity and gender. *Journal of Applied Gerontology*. https://doi.org/10.1177/0733464820954676.

Adams, T. M., & Anderson, L. R. (2019). *Policing in natural disasters: Stress, resilience, and the challenges of emergency management*. Philadelphia, PA: Temple University Press.

Aguirre, B. (2002). Editor's introduction. *International Journal of Mass Emergencies and Disasters, 20*(3), 289–292.

Aguirre, B. E., & Lane, D. (2019). Fraud in disaster: Rethinking the phases. *International Journal of Disaster Risk Reduction, 39*, 101232. https://doi.org/10.1016/j.ijdrr.2019.101232.

Aldrich, D. P., & Meyer, M. A. (2015). Social capital and community resilience. *American Behavioral Scientist, 59*(2), 254–269. https://doi.org/10.1177/0002764214550299.

Alston, M., & Kent, J. (2008). 'The big dry': The link between rural masculinities and poor health outcomes for farming men. *Journal of Sociology, 44*(2), 133–147. https://doi.org/10.1177/1440783308089166.

Anderson, W. A. (2005). Bringing children into focus on the social science disaster research agenda. *International Journal of Mass Emergencies and Disasters, 23*(3), 159–175.

Anderson, W. A. (2014). The great Alaska earthquake and the dawn of US social science earthquake research. In *Proceedings of the 10th National Conference in earthquake engineering*. Anchorage, AK: Earthquake Engineering Research Institute.

Anderson, W. A., & Mattingly, S. (1991). Future directions. In T. E. Drabek & G. J. Hoetmer (Eds.), *Emergency management: Principles and practice for local government* (pp. 311–335). Washington, D.C.: International City Management Association.

Arcaya, M., Raker, E. J., & Waters, M. C. (2020). The social consequences of disasters: Individual and community change. *Annual Review of Sociology, 46*, 11.1–11.21. https://doi.org/10.1146/annurev-soc-121919-054827.

Barsky, L. E., Trainor, J. E., Torres, M. R., & Aguirre, B. E. (2007). Managing volunteers: FEMA's urban search and rescue programme and interactions with unaffiliated responders in disaster response. *Disasters,*

31(4), 495–507. https://doi.org/10.1111/j.1467-7717.2007.01021.x.

Barton, A. H. (1969). *Communities in disaster: A sociological analysis of collective stress situations*. Garden City, NY: Doubleday.

Bates, F. L., & Peacock, W. G. (1987). Disaster and social change. In R. R. Dynes, B. De Marchi, & C. Pelanda (Eds.), *Sociology of disasters: Contributions of sociology to disaster research* (pp. 291–330). Milan, Italy: Franco Angeli Press.

Bates, F. L., & Pelanda, C. (1994). An ecological approach to disasters. In R. R. Dynes & K. J. Tierney (Eds.), *Disasters, collective behavior, and social organization* (pp. 145–159). Cranbury, NJ: Associated University Presses.

Britton, N. R. (1987). Toward a reconceptualization of disaster for the enhancement of social preparation. In R. R. Dynes, B. De Marchi, & C. Pelanda (Eds.), *Sociology of disasters: Contributions of sociology to disaster research* (pp. 31–55). Milan, Italy: Franco Angeli Press.

Britton, N. R. (1992). Editor's introduction. *International Journal of Mass Emergencies and Disasters, 10*(2), 261–267.

Browne, K. E., & Peek, L. (2014). Beyond the IRB: An ethical toolkit for long-term disaster research. *International Journal of Mass Emergencies and Disasters, 32* (1), 82–120.

Bullard, R. (2008). Differential vulnerabilities: Environmental and economic inequality and government response to unnatural disasters. *Social Research, 75* (3), 753–784.

Campbell, N. (2019). Disaster recovery among older adults: Exploring the intersection of vulnerability and resilience. In F. Rivera (Ed.), *Emerging voices in natural hazards research* (pp. 83–119). Oxford, UK: Butterworth-Heinemann.

Campbell, W. J. (2010). *Getting it wrong: Ten of the greatest misreported stories in American journalism*. Berkeley: University of California Press.

Caniglia, B. S., Jorgenson, A., Malin, S. A., Peek, L., & Pellow, D. (2021). Introduction: A 21st century public environmental sociology. In B. S. Caniglia, A. Jorgenson, S. A. Malin, L. Peek, D. Pellow, & X. Huang (Eds.), *Handbook of environmental sociology*. Springer.

Clarke, L. (2002). Panic: Myth or reality. *Contexts, 1*(3), 21–26.

Cope, M. R., Slack, T., Blanchard, T. C., & Lee, M. R. (2016). It's not whether you win or lose, it's how you place the blame: Shifting perceptions of recreancy in the context of the Deepwater Horizon oil spill. *Rural Sociology, 81*(3), 295–315. https://doi.org/10.1111/ruso.12096.

Cope, M. R., Slack, T., Jackson, J. E., & Parks, V. (2020). Community sentiment following the Deepwater Horizon oil spill disaster: A test of time, systemic community, and corrosive community models. *Journal of Rural Studies, 74*, 124–132.

Couch, S. R., & Kroll-Smith, J. S. (1985). The chronic technical disaster: Toward a social scientific perspective. *Social Science Quarterly, 66*(3), 564–575.

Couch, S. R., & Kroll-Smith, J. S. (1991). *Communities at risk: Collective responses to technological hazards* (Vol. 3). New York: Peter Lang Publishing.

Danielsson, E., Johansson, R., & Neal, D. M. (2015). Editorial: An introduction to Nordic research. *International Journal of Mass Emergencies and Disasters, 33* (3), 316–322.

Dash, N. (2013). Race and ethnicity. In D. S. K. Thomas, B. D. Phillips, W. E. Lovekamp, & A. Fothergill (Eds.), *Social vulnerability to disasters* (2nd ed., pp. 113–137). Boca Raton, FL: CRC Press.

Dash, N., & Gladwin, H. (2007). Evacuation decision making and behavioral responses: Individual and household. *Natural Hazards Review, 8*(3), 69–77. https://doi.org/10.1061/(ASCE)1527-6988(2007)8:3(69).

Dash, N., Peacock, W. G., & Morrow, B. H. (1997). And the poor get poorer: A neglected black community. In W. G. Peacock, B. H. Hearn, & H. Gladwin (Eds.), *Hurricane Andrew: Ethnicity, gender, and the sociology of disasters* (pp. 206–225). New York: Routledge.

Drabek, T. E. (2009). Bringing social problems perspectives into emergency management collegiate curricula. In J. A. Hubbard (Ed.), *Ideas from an emerging field: Teaching emergency management in higher education* (pp. 7–26). Fairfax, VA: Public Entity Risk Institute.

Drabek, T. E. (2017). The sociology of disaster. In K. O. Korgen (Ed.), *The Cambridge handbook of sociology: Specialty and interdisciplinary studies* (pp. 139–147). Cambridge, MA: Cambridge University Press.

Drury, J., Novelli, D., & Stott, C. (2013). Psychological disaster myths in the perception and management of mass emergencies. *Journal of Applied Social Psychology, 43*(11), 2259–2270. http://doi:10.1111/jasp.12176.

Dunlap, R. E., & Brulle, R. J. (2015). *Climate change and society: Sociological perspectives*. Oxford, England: Oxford University Press.

Dynes, R. R., de Marchi, B., & Pelanda, C. (Eds.). (1987). *Sociology of disasters: Contributions of sociology to disaster research*. Milan, Italy: Franco Angeli Press.

Dyson, M. E. (2006). *Come hell or high water: Hurricane Katrina and the color of disaster*. New York: Basic Civitas Books.

Elliott, J. R. (2015). Natural hazards and residential mobility: General patterns and racially unequal outcomes in the United States. *Social Forces, 93*(4), 1723–1747. https://doi.org/10.1093/sf/sou120.

Elliott, J. R., & Pais, J. (2006). Race, class, and Hurricane Katrina: Social differences in human responses to disaster. *Social Science Research, 35*(2), 295–321. https://doi.org/10.1016/j.ssresearch.2006.02.003.

Enarson, E. (2012). *Women confronting natural disaster: From vulnerability to resilience*. Boulder, CO: Lynne Rienner Publishers.

Enarson, E., Fothergill, A., & Peek, L. (2018). Gender and disasters. In H. Rodríguez, W. Donner, & J. E. Trainor (Eds.), *Handbook of disaster research* (2nd ed., pp. 205–223). New York: Springer.

Erikson, K. T. (1976). Loss of communality at Buffalo Creek. *The American Journal of Psychiatry, 133*(3), 302–305.

Erikson, K. T. (1994). *A new species of trouble: The human experience of modern disasters*. New York: W.W. Norton & Company.

Erikson, K., & Peek, L. (2022). *The continuing storm: Learning from Katrina*. University of Texas Press.

Fischer, H. W. (2008). *Response to disaster: Fact versus fiction and its perpetuation*. Lanham, MD: University Press of America.

Fothergill, A. (2000). Knowledge transfer between researchers and practitioners. *Natural Hazards Review, 1*(2), 91–98. https://doi.org/10.1061/(ASCE)1527-6988(2000)1:2(91).

Fothergill, A. (2004). *Heads above water: Gender, class, and family in the Grand Forks flood*. Albany, NY: The State University of New York Press.

Fothergill, A. (2017). Children, youth, and disaster. *Natural Hazard Science.* https://doi.org/10.1093/acrefore/9780199389407.013.23.

Fothergill, A., & Peek, L. (2004). Poverty and disasters in the United States: A review of recent sociological findings. *Natural Hazards, 32*(1), 89–110. https://doi.org/10.1023/B:NHAZ.0000026792.76181.d9

Fothergill, A., & Peek, L. (2015). *Children of Katrina*. Austin, TX: University of Texas Press.

Fothergill, A., Maestas, E. G., & Darlington, J. D. (1999). Race, ethnicity, and disasters in the United States: A review of the literature. *Disasters, 23*(2), 156–173. https://doi.org/10.1111/1467-7717.00111.

Freudenburg, W. R., Gramling, R. B., Laska, S., & Erikson, K. (2009). *Catastrophe in the making: The engineering of Katrina and the disasters of tomorrow*. Washington, D.C.: Island Press.

Fritz, C. E. (1961). Disaster. In R. K. Merton & R. A. Nisbet (Eds.), *Contemporary social problems* (pp. 651–694). New York: Harcourt, Brace, and World.

Fritz, C. E., & Mathewson, J. H. (1957). *Convergence behavior in disasters: A problem in social control*. Washington, D.C.: Committee on Disaster Studies, Disaster Research Group, National Research Council, National Academy of Sciences.

Fussell, E. (2015). The long-term recovery of New Orleans' population after Hurricane Katrina. *American Behavioral Scientist, 59*(10), 1231–1245. https://doi.org/10.1177/0002764215591184.

Gaillard, J. C., & Gomez, C. (2015). Post-disaster research: Is there gold worth the rush? *Jàmbá: Journal of Disaster Risk Studies, 7*(1), 1–6. https://doi.org/10.4102/jamba.v7i1.120.

Gaillard, J. C., & Peek, L. (2019). Disaster-zone research needs a code of conduct. *Nature, 575*, 440–442. https://doi.org/10.1038/d41586-019-03534-z.

Gill, D. A., Ritchie, L. A., & Picou, J. S. (2016). Sociocultural and psychosocial impacts of the Exxon Valdez oil spill: Twenty-four years of research in Cordova, Alaska. *The Extractive Industries and Society, 3*(4), 1105–1116. https://doi.org/10.1016/j.exis.2016.09.004.

Giritli Nygren, K., Öhman, A., & Olofsson, A. (2017). Doing and undoing of risk: The mutual constitution of risk and heteronormativity in contemporary society. *Journal of Risk Research, 20*, 418–432. https://doi.org/10.1080/13669877.2015.1088056.

Goodman, P. (2014). Race in California's prison fire camps for men: Prison politics, space, and the racialization of everyday life. *American Journal of Sociology, 120*(2), 352–394. https://doi.org/10.1086/678303.

Gotham, K. F. (2014). Reinforcing inequalities: The impact of the CDBG program on post-Katrina rebuilding. *Housing Policy Debate, 24*(1), 192–212. https://doi.org/10.1080/10511482.2013.840666.

Green, S. P. (2006). Looting, law, and lawlessness. *Tulane Law Review, 81*, 1129.

Hamideh, S. (2020). Opportunities and challenges of public participation in post-disaster recovery planning: Lessons from Galveston, TX. *Natural Hazards Review, 21*(4), 05020009. https://doi.org/10.1061/(ASCE)NH.1527-6996.0000399.

Haney, T. J., & Gray-Scholz, D. (2019). Flooding and the 'new normal': What is the role of gender in experiences of post-disaster ontological security? *Disasters, 44*(2), 262–284. https://doi.org/10.1111/disa.12372.

Harper, D. W., & Frailing, K. (2010). *Crime and criminal justice in disaster*. Durham, NC: Carolina Academic Press.

Harper, D. W., & Frailing, K. (2012). *Crime and criminal justice in disaster* (2nd ed.). Durham, NC: Carolina Academic Press.

Harper, D. W., & Frailing, K. (2015). *Crime and criminal justice in disaster* (3rd ed.). Durham, NC: Carolina Academic Press.

Hartman, C. W., & Squires, G. D. (2006). *There is no such thing as a natural disaster: Race, class, and Hurricane Katrina*. New York: Taylor & Francis.

Hendricks, M. D., Meyer, M. A., Gharaibeh, N. G., Van Zandt, S., Masterson, J., Cooper, J. T., Jr., et al. (2018). The development of a participatory assessment technique for infrastructure: Neighborhood-level monitoring towards sustainable infrastructure systems. *Sustainable Cities and Society, 38*, 265–274. https://doi.org/10.1016/j.scs.2017.12.039.

Henry, F. (2020a, May 29). COVID-19 is a disaster. So is mass Black death. *Medium.* https://medium.com/@henry.feliciaa/covid-19-is-a-disaster-so-is-mass-black-death-c38a29b5936c

Henry, F. (2020b, June 17). *COVID Calls 6.17.2020, Felicia Henry and Monica Sanders* [Video]. YouTube. Accessed Aug 3, 2020, from https://www.youtube.com/watch?v=mFZMqD0OtmY

Herring, A. (2013). Sociology of disaster. In P. Bobrowsky (Ed.), *Encyclopedia of natural hazards* (pp. 926–935). Dordrecht, Netherlands: Springer.

Hewitt, K. (1983). *Interpretations of calamity from the viewpoint of human ecology*. New York: Routledge.

Hewitt, K. (1997). *Regions of risk: A geographical introduction to disasters*. Harlow: Longman.

Hines, E., Mathews, M., & Peek, L. (2020). Global list and interactive web map of university-based hazards and disaster research centers. *Natural Hazards Review, 21* (2). https://doi.org/10.1061/(ASCE)NH.1527-6996.0000371.

Holguín-Veras, J., Pérez, N., Ukkusuri, S., Wachtendorf, T., & Brown, B. (2007). Emergency logistics issues affecting the response to Katrina: A synthesis and preliminary suggestions for improvement. *Transportation Research Record, 2022*(1), 76–82. https://doi.org/10.3141/2022-09.

Holguín-Veras, J., Jaller, M., Van Wassenhove, L. N., Pérez, N., & Wachtendorf, T. (2012). On the unique features of post-disaster humanitarian logistics. *Journal of Operations Management, 30*(7–8), 494–506. https://doi.org/10.1016/j.jom.2012.08.003.

Houghton, R. (2009). 'Everything became a struggle, absolute struggle': Post-flood increases in domestic violence in New Zealand. In E. Enarson & P. G. D. Chakrabarti (Eds.), *Women, gender, and disaster: Global issues and initiatives* (pp. 99–111). Delhi: Sage.

Howell, J., & Elliott, J. R. (2019). Damages done: The longitudinal impacts of natural hazards on wealth inequality in the United States. *Social Problems, 66* (3), 448–467. https://doi.org/10.1093/socpro/spy016.

Hyndman, J. (2008). Feminism, conflict, and disasters in post-tsunami Sri Lanka. *Gender, Technology, and Development, 12*(1), 101–121. https://doi.org/10.1177/097185240701200107.

Jenkins, P., & Phillips, B. (2008). Battered women, catastrophe, and the context of safety after Hurricane Katrina. *Feminist Formations, 20*(3), 49–68. https://doi.org/10.1353/nwsa.0.0047.

Kappeler, V. E., & Potter, G. W. (1996). *The mythology of crime and criminal justice*. Prospect Heights, IL: Waveland.

Kelman, I. (2005). Operational ethics for disaster research. *International Journal of Mass Emergencies and Disasters, 23*(3), 141–158.

Kendra, J. M., & Gregory, S. (2019). Ethics in disaster research: A new declaration. In J. Kendra, S. G. Knowles, & T. Wachtendorf (Eds.), *Disaster research and the second environmental crisis* (pp. 319–341). Cham, Switzerland: Springer.

Kendra, J. M., & Wachtendorf, T. (2003). Reconsidering convergence and converger legitimacy in response to the World Trade Center disaster. *Research in Social Problems and Public Policy, 11*(1), 97–122.

Kendra, J. M., & Wachtendorf, T. (2016). *American Dunkirk: The waterborne evacuation of Manhattan on 9/11*. Philadelphia, PA: Temple University Press.

Kirschke, J., & Van Vliet, W. (2005). "How can they look so happy?": Reconstructing the place of children after Hurricane Katrina: Images and reflections. *Children, Youth, and Environments, 15*(2), 378–391.

Klinenberg, E. (2002). *Heat wave: A social autopsy of disaster in Chicago*. Chicago, IL: University of Chicago Press.

Knowles, S. G. (2013). *The disaster experts: Mastering risk in modern America*. Philadelphia, PA: University of Pennsylvania Press.

Kreps, G. A. (1984). Sociological inquiry and disaster research. *Annual Review of Sociology, 10*(1), 309–330.

Kroll-Smith, J. S., & Couch, S. R. (1990). Sociological knowledge and the public at risk: A "self-study" of sociology, technological hazards, and moral dilemmas. *Sociological Practice Review, 1*(2), 120–127.

Kroll-Smith, S. (2018). *Recovering inequality: Hurricane Katrina, the San Francisco earthquake of 1906, and the aftermath of disaster*. Austin, TX: University of Texas Press.

Kroll-Smith, S., Baxter, V., & Jenkins, P. (2015). *Left to chance: Hurricane Katrina and the story of two New Orleans neighborhoods*. Austin, TX: University of Texas Press.

Laska, S. (2020). *Louisiana's response to extreme weather: A coastal state's adaptation challenges and successes*. Basel, Switzerland: Springer International Publishing.

Laska, S., Howell, S., & Jerolleman, A. (2018). "Built-in" structural violence and vulnerability: A common threat to resilient disaster recovery. In M. J. Zakour, N. B. Mock, & P. Kadetz (Eds.), *Creating Katrina, rebuilding resilience* (pp. 99–129). Oxford, UK: Butterworth-Heinemann.

Lein, L., Angel, R., Beausoleil, J., & Bell, H. (2012). The basement of extreme poverty: Katrina survivors and poverty programs. In L. Weber & L. Peek (Eds.), *Displaced: Life in the Katrina diaspora* (pp. 47–62). Austin, TX: University of Texas Press.

Lindell, M. K. (2013). Disaster studies. *Current Sociology, 61*(5–6), 797–825. https://doi.org/10.1177/0011392113484456.

Lowe, S., & Fothergill, A. (2003). A need to help: Emergent volunteer behavior after September 11th. In J. Monday (Ed.), *Beyond September 11: An account of post-disaster research* (pp. 293–314). Boulder, CO: Natural Hazards Center, University of Colorado Boulder.

Luft, R. E. (2012). Community organizing in the Katrina diaspora: Race, gender, and the case of the People's Hurricane Relief Fund. In L. Weber & L. Peek (Eds.), *Displaced: Life in the Katrina diaspora* (pp. 233–255). Austin, TX: University of Texas Press.

Luft, R. E. (2016). Racialized disaster patriarchy: An intersectional model for understanding disaster ten years after Hurricane Katrina. *Feminist Formations, 28*(2), 1–26.

Mach, K. J., Kraan, C. M., Hino, M., Siders, A. R., Johnston, E. M., & Field, C. B. (2019). Managed

retreat through voluntary buyouts of flood-prone properties. *Science Advances, 5*(10), eaax8995. https://doi.org/10.1126/sciadv.aax8995.

Malin, S. A., & Ryder, S. S. (2018). Developing deeply intersectional environmental justice scholarship. *Environmental Sociology, 4*(1), 1–7. https://doi.org/10.1080/23251042.2018.1446711.

Mason, B. J. (2012). The women of Renaissance Village: From homes in New Orleans to a trailer park in Baker, Louisiana. In L. Weber & L. Peek (Eds.), *Displaced: Life in the Katrina diaspora* (pp. 183–197). Austin, TX: University of Texas Press.

Matthewman, S. (2015). *Disasters, risks, and revelation: Making sense of our times*. London: Palgrave Macmillan.

Mayer, B., Running, K., & Bergstrand, K. (2015). Compensation and community corrosion: Perceived inequalities, social comparisons, and competition following the Deepwater Horizon oil spill. *Sociological Forum, 30*(2), 369–390.

McDonald-Harker, C., Bassi, E. M., & Haney, T. J. (2020). "We need to do something about this": Children and youth's post-disaster views on climate change and environmental crisis. *Sociological Inquiry.* https://doi.org/10.1111/soin.12381.

McEntire, D. A., Robinson, R. J., & Weber, R. T. (2003). *Business responses to the World Trade Center disaster: A study of corporate roles, functions, and interaction with the public sector*. Denton, TX: University of North Texas Press.

McFarlane, A. C., & Norris, F. H. (2006). Definitions and concepts in disaster research. In S. Galea, F. H. Norris, M. J. Friedman, & P. J. Watson (Eds.), *Methods for disaster mental health research* (pp. 3–19). New York: The Guilford Press.

Merton, K. (1963). Introduction. In A. Barton (Ed.), *Social organization under stress: A sociological review of disaster studies* (pp. XVII–XXXVI). Washington, D.C.: National Academy of Sciences, National Research Council.

Meyer, M. A. (2016). Elderly perceptions of social capital and age-related disaster vulnerability. *Disaster Medicine and Public Health Preparedness, 11*(1), 48–55.

Meyer, M. A. (2018). Social capital in disaster research. In H. Rodríguez, W. Donner, & J. Trainor (Eds.), *Handbook of disaster research* (2nd ed., pp. 263–286). Cham, Switzerland: Springer.

Meyer, M. A., Mitchell, B., Van Zandt, S., & Nolan, S. (2020). The 2016 unexpected mid-state Louisiana flood: With special focus on the different rescue and recovery responses it engendered. In S. Laska (Ed.), *Louisiana's response to extreme weather: A coastal state's adaptation challenges and successes* (pp. 263–281). Basel, Switzerland: Springer International Publishing.

Mileti, D. (1999). *Disasters by design: A reassessment of natural hazards in the United States*. Washington, D.C.: Joseph Henry Press.

Miura, R. (2016). *The characteristics and importance of Japanese disaster sociology: Perspectives from regional and community studies in Japan*. Chiba Prefecture: Japan Association of Regional and Community Studies.

Mohai, P., Pellow, D., & Roberts, J. T. (2009). Environmental justice. *Annual Review of Environment and Resources, 34*, 405–430. https://doi.org/10.1146/annurev-environ-082508-094348.

Mohammad, L., & Peek, L. (2019). Exposure outliers: Children, mothers, and cumulative disaster exposure in Louisiana. *Journal of Family Strengths, 19*, 4. https://digitalcommons.library.tmc.edu/jfs/vol19/iss1/4/.

Montelius, E., & Giritli Nygren, K. (2014). "Doing" risk, "doing" difference: Towards an understanding of the intersections of risk, morality, and taste. *Health, Risk, and Society, 16*, 431–443. https://doi.org/10.1080/13698575.

National Research Council. (2006). *Facing hazards and disasters: Understanding human dimensions*. Washington, D.C.: National Academies Press.

Neal, D. M. (1984). Blame assignment in a diffuse disaster situation: A case example of the role of an emergent citizen group. *Mass Emergencies and Disasters, 2*, 251–266.

Neal, D. M. (1994). The consequences of excessive unrequested donations: The case of Hurricane Andrew. *Disaster Management, 6*, 23–28.

Nogami, T. (2018). Disaster myths among disaster response professionals and the source of such misconceptions. *Journal of Contingencies and Crisis Management, 26*(4), 491–498. https://doi.org/10.1111/1468-5973.12218.

Norris, F. H., Friedman, M. J., Watson, P. J., Byrne, C. M., Diaz, E., & Kaniasty, K. (2002). 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001. *Psychiatry: Interpersonal and Biological Processes, 65*(3), 207–239. https://doi.org/10.1521/psyc.65.3.207.20173.

Okabe, K., & Hirose, H. (1985). The general trend of sociobehavioral disaster studies in Japan. *International Journal of Mass Emergencies and Disasters, 3*(1), 1–13.

O'Keefe, P., Westgate, K., & Wisner, B. (1976). Taking the naturalness out of natural disasters. *Nature, 260*, 566–567.

Olson, R. (2018). Speaking truth to power: Please don't call them natural disasters. *Research Counts, 2*(3). Boulder, CO: Natural Hazards Center, University of Colorado Boulder. https://hazards.colorado.edu/news/research-counts/speaking-truth-to-power-please-don-t-call-them-natural-disasters.

Parkinson, D., & Zara, C. (2016). Emotional and personal costs for men of the Black Saturday bushfires in Victoria, Australia. In E. Enarson & B. Pease (Eds.), *Men, Masculinities, and Disaster* (pp. 81–91). New York: Routledge.

Parks, V., Slack, T., Ramchand, R., Drakeford, L., Finucane, M. L., & Lee, M. R. (2020). Fishing households, social support, and depression after the Deepwater Horizon oil spill. *Rural Sociology, 85*(2), 495–518. https://doi.org/10.1111/ruso.12297.

Peacock, W. G., Killian, C. D., & Bates, F. L. (1987). The effects of disaster damage and housing aid on household recovery following the 1976 Guatemalan earthquake. *International Journal of Mass Emergencies and Disasters, 5*(1), 63–88.

Peacock, W. G., Morrow, B. H., & Gladwin, H. (Eds.). (1997). *Hurricane Andrew: Ethnicity, gender, and the sociology of disaster*. New York: Routledge.

Peacock, W. G., Van Zandt, S., Zhang, Y., & Highfield, W. E. (2014). Inequities in long-term housing recovery after disasters. *Journal of the American Planning Association, 80*(4), 356–371. https://doi.org/10.1080/01944363.2014.980440.

Peek, L. (2008). Children and disasters: Understanding vulnerability, developing capacities, and promoting resilience—An introduction. *Children, Youth, and Environments, 18*(1), 1–29.

Peek, L. (2011). *Behind the backlash: Muslim Americans after 9/11*. Philadelphia, PA: Temple University Press.

Peek, L. (2013). Age. In D. S. K. Thomas, B. D. Phillips, W. E. Lovekamp, & A. Fothergill (Eds.), *Social vulnerability to disasters* (2nd ed., pp. 167–198). Boca Raton, FL: CRC Press.

Peek, L., & Domingue, S. (2020). Recognizing vulnerability and capacity: Federal initiatives focused on children and youth across the disaster lifecycle. In S. Haeffele & V. Storr (Eds.), *Government responses to crisis* (pp. 61–87). London: Palgrave Macmillan.

Peek, L., & Guikema, S. (2021). Interdisciplinary theory, methods, and approaches for hazads and disaster research: An introduction to the special issue. *Risk Analysis, 41*(7), 1066–1071. https://doi.org/10.1111/risa.13777

Peek, L., & Meyer, M. (2016). When hate is a crime: Temporal and geographic patterns of anti-Islamic hate crime after 9/11. In D. W. Harper & K. Frailing (Eds.), *Crime and criminal justice in disaster* (3rd ed., pp. 247–270). Durham, NC: Carolina Academic Press.

Peek, L. A., & Mileti, D. S. (2002). The history and future of disaster research. In R. B. Bechtel & A. Churchman (Eds.), *Handbook of environmental psychology* (pp. 511–524). Hoboken, NJ: John Wiley & Sons.

Peek, L. A., & Sutton, J. N. (2003). An exploratory comparison of disasters, riots, and terrorist acts. *Disasters, 27*(4), 319–335. https://doi.org/10.1111/j.0361-3666.2003.00236.x.

Peek, L., Abramson, D., Cox, R., Fothergill, A., & Tobin, J. (2018). Children and disasters. In H. Rodríguez, W. Donner, & J. E. Trainor (Eds.), *Handbook of disaster research* (2nd ed., pp. 243–262). New York: Springer.

Peek, L., Champeau, H., Austin, J., Matthews, M., & Wu, H. (2020a). What methods do social scientists use to study disasters?: An analysis of the social science extreme events research (SSEER) network. *American Behavioral Scientist, 64*(8), 1066–1094. https://doi.org/10.1177/0002764220938105.

Peek, L., Tobin, J., Adams, R., Wu, H., & Mathews, M. (2020b). A framework for convergence research in the hazards and disaster field: The Natural Hazards Engineering Research Infrastructure CONVERGE facility. *Frontiers in Built Environment, 6*, 110. https://doi.org/10.3389/fbuil.2020.00110.

Pellow, D. N., & Nyseth Brehm, H. (2013). An environmental sociology for the twenty-first century. *Annual Review of Sociology, 39*, 229–250. https://doi.org/10.1146/annurev-soc-071312-145558.

Penta, S., Wachtendorf, T., & Nelan, M. M. (2019). Disaster relief as social action: A Weberian look at postdisaster donation behavior. *Sociological Forum, 35*(1), 145–166. https://doi.org/10.1111/SOCF.12571.

Perez, C. C. (2019). *Invisible women: Exposing data bias in a world designed for men*. New York: Random House.

Perez, V. (2020, July 24). *The Highlands Bunker 7.24.2020 Victor Perez and Madinah Wilson-Anton* [Podcast]. Accessed Aug 7, 2020, from https://www.patreon.com/posts/39650016

Perez, V., & Egan, J. (2016). Knowledge and concern for sea level rise in an urban environmental justice community. *Sociological Forum, 31*(S1), 885–907.

Perry, R. W., & Lindell, M. K. (2007). *Emergency planning*. Hoboken, NJ: John Wiley.

Perry, R. W., & Quarantelli, E. L. (Eds.). (2005). *What is a disaster?: New answers to old questions*. Philadelphia, PA: Xlibris Corporation.

Petridou, E., Danielsson, E., Olofsson, A., Lundgren, M., & Große, C. (2019). If crisis or war comes: A study of risk communication of eight European Union member states. *Journal of International Crisis and Risk Communication Research, 2*(2), 207–232. https://doi.org/10.30658/jicrcr.2.2.3.

Phillips, B. D. (2015). *Disaster recovery*. Boca Raton, FL: CRC Press.

Phillips, B. D., Jenkins, P., & Enarson, E. (2010). Violence and disaster vulnerability. In B. D. Phillips, D. S. K. Thomas, A. Fothergill, & L. Blinn-Pike (Eds.), *Social vulnerability to disasters* (pp. 279–306). Boca Raton, FL: CRC Press.

Picou, J. S., & Nicholls, K. (2019). *Caught in the path of Katrina: A survey of the hurricane's human effects*. Austin, TX: University of Texas Press.

Picou, J. S., Marshall, B. K., & Gill, D. A. (2004). Disaster, litigation, and the corrosive community. *Social Forces, 82*(4), 1493–1522. https://doi.org/10.1353/sof.2004.0091.

Porfiriev, B. (1998). *Disaster policy and emergency management in Russia*. Commack, NY: Nova Science Publishers.

Prasad, M. (2018). Problem-solving sociology. *Contemporary Sociology, 47*(4), 393–398.

Prince, S. H. (1920). *Catastrophe and social change: Based upon a sociological study of the Halifax disaster*. New York: Columbia University Press.

Purdum, J. C. (2019). Hazardous or vulnerable? Prisoners and emergency planning in the US. In F. Rivera (Ed.), *Emerging voices in natural hazards research* (pp. 179–209). Oxford, UK: Butterworth-Heinemann.

Purdum, J. C., & Meyer, M. A. (2020). Prisoner labor throughout the life cycle of disasters. *Risk, Hazards, & Crisis in Public Policy, 11*(3), 296–319. https://doi.org/10.1002/rhc3.12191.

Quarantelli, E. L. (1987). Disaster studies: An analysis of the social historical factors affecting the development of research in the area. *International Journal of Mass Emergencies and Disasters, 5*(3), 285–310.

Quarantelli, E. L. (1988). Disaster crisis management: A summary of research findings. *Journal of Management Studies, 25*(4), 373–385.

Quarantelli, E. L. (1991). *Lessons from research: Findings on mass communications system behavior in the pre, trans, and post impact periods*. Newark, DE: Disaster Research Center, University of Delaware.

Quarantelli, E. L. (1993). Community crises: An exploratory comparison of the characteristics and consequences of disasters and riots. *Journal of Contingencies and Crisis Management, 1*(2), 67–78.

Quarantelli, E. L. (1996). The future is not the past repeated: Projecting disasters in the 21st century from current trends. *Journal of Contingencies and Crisis Management, 4*(4), 228–240.

Quarantelli, E. L. (Ed.). (1998). *What is a disaster? Perspectives on the question*. New York: Routledge.

Quarantelli, E. L. (2008). Conventional beliefs and counterintuitive realities. *Social Research: An International Quarterly, 75*(3), 873–904.

Quarantelli, E. L., & Dynes, R. R. (1972). When disaster strikes (it isn't much like what you've heard and read about). *Psychology Today, 5*, 66–70.

Quarantelli, E. L., & Dynes, R. R. (1977). Response to social crisis and disaster. *Annual Review of Sociology, 3*(1), 23–49.

Quarantelli, E. L., & Yamamoto, Y. (1982). *Inventory of the Japanese disaster research literature in the social and behavioral sciences*. Columbus, OH: Disaster Research Center, The Ohio State University.

Quigley, W. P. (2008). What Katrina revealed. *Harvard Law & Policy Review, 2*, 361–384.

Rivera, F. I., Kapucu, N., & Hawkins, C. (2015). Rural community disaster resiliency: Self-organizing collective action among farmworkers in Central Florida. *International Journal of Mass Emergencies and Disasters, 33*(2), 213–227.

Rivera, J. D., & Miller, D. S. (2007). Continually neglected: Situating natural disasters in the African American experience. *Journal of Black Studies, 37*(4), 502–522. https://doi.org/10.1177/0021934706296190.

Rodríguez, H., Trainor, J., & Quarantelli, E. L. (2006). Rising to the challenges of a catastrophe: The emergent and prosocial behavior following Hurricane Katrina. *The Annals of the American Academy of Political and Social Science, 604*(1), 82–101. https://doi.org/10.1177/0002716205284677.

Rodríguez, H., Quarantelli, E. L., & Dynes, R. R. (Eds.). (2007). *Handbook of disaster research*. New York: Springer.

Rodríguez, H., Donner, W., & Trainor, J. E. (Eds.). (2018). *Handbook of disaster research* (2nd ed.). New York: Springer.

Ryder, S. S. (2017). A bridge to challenging environmental inequality: Intersectionality, environmental justice, and disaster vulnerability. *Social Thought and Research, 34*, 85–115. https://doi.org/10.17161/1808.25571.

Santos-Hernández, J. M. (2006). 'Losing everything': Undocumented Latino workers and Hurricane Katrina. In Natural Hazards Center (Ed.), *Learning from catastrophe: Quick response research in the wake of Hurricane Katrina* (pp. 131–150). Boulder, CO: Natural Hazards Center, University of Colorado Boulder.

Santos-Burgoa, C., Goldman, A., Andrade, E., Barrett, N., Colon-Ramos, U., Edberg, M., Garcia-Meza, A., Goldman, L., Roess, A., Sandberg, J., & Zeger, S. (2018). *Ascertainment of the estimated excess mortality from Hurricane Maria in Puerto Rico*. Washington, D.C.: The George Washington University.

Scanlon, T. J. (1991). *Convergence revisited: A new perspective on a little studied topic*. Boulder, CO: Natural Hazards Center, University of Colorado Boulder.

Schorr, J. (1987). Some contributions German Katastrophen-Soziologie can make to the sociology of disaster. *International Journal of Mass Emergencies and Disasters, 5*(2), 115–135.

Sharkey, P. (2007). Survival and death in New Orleans: An empirical look at the human impact of Katrina. *Journal of Black Studies, 37*(4), 482–501. https://doi.org/10.1177/0021934706296188.

Siders, A. R. (2019). Social justice implications of US managed retreat buyout programs. *Climatic Change, 152*, 239–257. https://doi.org/10.1007/s10584-018-2272-5.

Stallings, R. A. (2002). Weberian political sociology and sociological disaster studies. *Sociological Forum, 17*(2), 281–305.

Steffen, S. L., & Fothergill, A. (2009). 9/11 volunteerism: A pathway to personal healing and community engagement. *The Social Science Journal, 46*(1), 29–46. https://doi.org/10.1016/j.soscij.2008.12.005.

Subba, R., & Bui, T. (2010). An exploration of physical-virtual convergence behaviors in crisis situations. In *Proceedings of the 43rd Hawaii international conference on system sciences* (pp. 1–10). Honolulu, HI: Institute of Electrical and Electronics Engineers.

Subba, R., & Bui, T. (2017). Online convergence behavior, social media communications, and crisis response: An empirical study of the 2015 Nepal earthquake police Twitter project. In *Proceedings of the 50 Hawaii international conference on system sciences* (pp. 284–293). Honolulu, HI: Institute of Electrical and Electronics Engineers.

Taylor, D. (2014). *Toxic communities: Environmental racism, industrial pollution, and residential mobility*. New York: New York University Press.

Thomas, D. S. K., Phillips, B. D., Lovekamp, W. E., & Fothergill, A. (Eds.). (2013). *Social vulnerability to disasters* (2nd ed.). Boca Raton, FL: CRC Press.

Tierney, K. (1999). Toward a critical sociology of risk. *Sociological Forum, 2*(14), 215–242.

Tierney, K. (2007). From the margins to the mainstream? Disaster research at the crossroads. *Annual Review of Sociology, 33*, 503–525. https://doi.org/10.1146/annurev.soc.33.040406.131743.

Tierney, K. (2014). *The social roots of risk: Producing disasters, promoting resilience*. Palo Alto, CA: Stanford Business Books.

Tierney, K. (2019). *Disasters: A sociological approach*. Medford, MA: Polity Press.

Tierney, K., Bevc, C., & Kuligowski, E. (2006). Metaphors matter: Disaster myths, media frames, and their consequences in Hurricane Katrina. *The Annals of the American Academy of Political and Social Science, 604*(1), 57–81. https://doi.org/10.1177/0002716205285589.

Tobin-Gurley, J., & Enarson, E. (2013). Gender. In D. S. K. Thomas, B. D. Phillips, W. E. Lovekamp, & A. Fothergill (Eds.), *Social vulnerability to disasters* (2nd ed., pp. 139–165). Boca Raton, FL: CRC Press.

Van Landingham, M. J. (2017). *Weathering Katrina: Culture and recovery among Vietnamese Americans*. New York: Russell Sage Foundation.

Vickery, J. (2017). Using an intersectional approach to advance understanding of homeless persons' vulnerability to disaster. *Environmental Sociology, 4*(1), 136–147. https://doi.org/10.1080/23251042.2017.1408549.

Villarreal, M., & Meyer, M. A. (2020). Women's experiences across disasters: A study of two towns in Texas, United States. *Disasters, 44*(2), 285–306. https://doi.org/10.1111/disa.12375.

Wachtendorf, T. (2019). A case for the grand challenge of disaster science. In J. Kendra, S. G. Knowles, & T. Wachtendorf (Eds.), *Disaster research and the second environmental crisis* (pp. 343–351). Cham, Switzerland: Springer.

Wachtendorf, T. (2020, March 16). Opinion: Don't mock people for buying extra toilet paper—they're doing the best they can with inconsistent and sometimes wrong advice. *Market Watch*. https://www.marketwatch.com/story/dont-mock-people-for-hoarding-toilet-paper-theyre-doing-the-best-they-can-with-inconsistent-and-sometimes-wrong-advice-2020-03-15

Wachtendorf, T., Brown, B., & Holguin-Veras, J. (2013). Catastrophe characteristics and their impact on critical supply chains: Problematizing materiel convergence and management following Hurricane Katrina. *Journal of Homeland Security and Emergency Management, 10*(2), 497–520. https://doi.org/10.1515/jhsem-2012-0069.

Wachtendorf, T., Penta, S., & Nelan, M. (2015). When push comes to shove: The framing of need in disaster relief efforts. In H. Egner, M. Schorch, & M. Voss (Eds.), *Learning and calamities* (pp. 255–272). London: Routledge.

Wallemacq, P., & House, R. (2018). *Economic losses, poverty, and disasters: 1998–2017*. Louvain: Centre for Research on the Epidemiology of Disasters and United Nations Office for Disaster Risk Reduction.

Warheit, G. J. (1976). Natural disasters and civil-disturbances: Similarities and differences. *Mass Emergencies, 1*(2), 131–137.

Webb, G. R. (2007). The sociology of disaster. In C. D. Bryant & D. L. Peck (Eds.), *21st century sociology: A reference handbook* (pp. 278–285). Thousand Oaks, CA: Sage.

Webb, G. (2018). The cultural turn in disaster research: Understanding resilience and vulnerability through the lens of culture. In H. Rodríguez, W. Donner, & J. Trainor (Eds.), *Handbook of disaster research* (2nd ed., pp. 109–121). New York: Springer.

Wenger, D., & James, T. (1991). *The convergence of volunteers in a consensus crisis: The case of the 1985 Mexico City earthquake*. College Station, TX: Hazard Reduction & Recovery Center.

White, G. F., & Haas, J. E. (1975). *Assessment of research on natural hazards*. Cambridge, MA: Massachusetts Institute of Technology Press.

Williams, B. D., & Webb, G. R. (2019). Social vulnerability and disaster: Understanding the perspectives of practitioners. *Disasters, 45*(2), 278–295. https://doi.org/10.1111/disa.12422.

Wilson, D. (2014). Price gouging, construction cartels, or repair monopolies: Competition law issues following natural disasters. *Canterbury Law Review, 53*, 53–90.

Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). *At risk: Natural hazards, people's vulnerability, and disasters*. New York: Routledge.

Zahran, S., Peek, L., & Brody, S. D. (2008). Youth mortality by forces of nature. *Children, Youth, and Environments, 18*(1), 371–388.

Zahran, S., Shelley, T. O., Peek, L., & Brody, S. D. (2009). Natural disasters and social order: Modeling crime outcomes in Florida. *International Journal of Mass Emergencies and Disasters, 27*(1), 26–52.