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COLLECTIVE BEHAVIOR IN THE SEPTEMBER 11, 2001 EVACUATION OF THE WORLD TRADE CENTER

Rory Connell

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Rory Connell
rconnell@udel.edu

Disaster Research Center
University of Delaware
Newark, DE 19716

Abstract

Collective behavior framework is utilized to examine the evacuation of the World Trade Center complex following the attacks of September 11. Using both first-person newspaper accounts and media reports, the paper focuses on emerging norms in the decision to evacuate as well as the evacuation process itself. Three key factors affected the decision to evacuate: (1) social location, (2) the role of leaders, and (3) the level of perceived threat. Helping behavior, the definition of norms in the stairwells, and episodes of deviant behavior as emerging norms were all evident in the evacuation process. Panic was not widely observed during the evacuation of the Twin Towers. Improvements made following the 1993 World Trade Center attack contributed to a more successful evacuation.

Introduction

This paper analyzes the evacuation of the buildings in the World Trade Center (WTC) complex following the September 11 attacks. While current statistics indicate that roughly three thousand people tragically died as a result of the attacks, the fatalities of this event represent a very small percentage of the estimated 10,000-15,000 individuals that were present in the WTC on a typical day (Cauchon, 2001). By virtually any measure, the evacuation of the WTC was extremely successful. As a result, analysis of this evacuation process can provide valuable lessons for emergency planning in future events. Collective behavior theory will be utilized in order to conceptualize the decision-making process of the evacuees as well as their flight from the buildings.

Context for Analysis

The evacuation procedure is of particular interest from a social science perspective due to the wealth of knowledge about evacuation patterns that exists in the collective behavior literature and for the possibility of adding to that knowledge. The

relevance of this conceptual approach to the evacuation of the WTC is apparent in Turner and Killian's (1987) definition of collective behavior, in which a, "collectivity is oriented toward an object of attention and arrives at some shared objective, but these are not defined in advance, and there are no formal procedures for reaching decisions" (p. 4). Clearly, in the case of the September 11 attacks, flight from danger became the objective of the individuals inside the WTC. Even though formal evacuation procedures such as building guidelines and organizational emergency procedures were present, individuals within the buildings experienced various physical, conditional, situational, and structural barriers during the evacuation process. Physical barriers included injuries sustained as a result of the attacks and pre-existing physical conditions such as asthma or other disabilities. Conditional barriers were event-related environmental disruptions such as the presence of smoke, fire, or water. Situational barriers were typically a result of the increased use of stairwells and corridors, resulting in crowded conditions during the evacuation process. Structural barriers represented event-related changes in the built environment, including collapsed corridors and debris-blocked stairwells. In addition to the barriers that may have impeded the established evacuation procedure, formal instructions from building officials repeatedly assured occupants that the building was secure. As a result, individuals and organizations quite often had to overcome these obstacles in order to safely evacuate.

The evacuation of the WTC buildings and surrounding structures following the attacks is notable for several reasons. First, the evacuation was, for the most part, extremely successful. On an average workday, it is estimated that 50,000 individuals visited or worked in the two main towers of the WTC. Current estimates, however, suggest that the number of individuals in the towers on the morning of September 11 was between 10,000 and 15,000 (Cauchon, 2001). As Cauchon notes, the relatively low

building occupancy on September 11 can largely be attributed to the time of day of the attacks (many employees had yet to report to work and the buildings were largely devoid of tourists because the observation decks were not scheduled to open until 9:30 a.m.) (2001). Despite the high population that had to evacuate the WTC, it is currently believed that roughly three thousand individuals were killed as a result of the terrorist attacks. This relatively effective evacuation is even more impressive when one considers the time-sensitive nature of the event. While it was not known to the inhabitants of the building at the start of the attacks, the evacuation process was only possible during a very brief time period.

Second, the evacuation of the WTC will undoubtedly serve as the central focus of high-rise disaster planning in the future. While the unprecedented magnitude of the disaster ensures its status as the benchmark of evacuation studies, the evacuation of the WTC is also of interest because it contradicted the existing knowledge of high-rise evacuation procedures and firefighting measures (Berry, Landsberg, and Smith, 2001). Individuals in high-rise structures are typically instructed to remain where they are until they receive formal instructions to evacuate the premises. However, those who abided by these guidelines perished in this disaster. Also, firefighting knowledge posits that high-rise blazes should be fought from within the structure; a belief that may have contributed to the deaths of scores of firefighters. Accordingly, the lessons learned from the disastrous events of September 11 may lead to significant changes to the existing disaster evacuation policies.

Third, an examination of the evacuation process of September 11 may help to gauge the lessons learned from the 1993 terrorist attack on the WTC. On February 26, 1993, a massive explosion in an underground garage in one of the WTC towers resulted in six deaths, over a thousand injuries, and millions of dollars in damage (U.S. State

Department, 2001). As a consequence of this event, numerous safety improvements were made to the WTC structures and emergency plans. In addition, many organizations located within the WTC significantly improved their evacuation plans following the 1993 terrorist bombing. Finally, the evacuation experiences of many of the workers in the buildings in the 1993 attack may have had an impact on their decision-making process during the September 11 disaster.

Fourth, the extreme nature of the disaster event provides an opportunity to test theories of collective behavior. While many collective behavior studies have focused on evacuation processes in disaster events (Quarantelli, 1957; Johnson 1987; Johnson, Feinberg, and Johnston, 1994), the events that these studies investigated do not approach the magnitude of the September 11 attacks on the WTC. While Aguirre, Wenger, and Vigo (1998) did study the evacuation of the WTC during the 1993 bombing, this evacuation effort did not match the scale of the September 11 attacks. Clearly, an examination of collective behavior in the September 11 evacuations of the WTC buildings can provide an important perspective on the existing knowledge regarding collective behavior in disaster events.

In particular, this paper will look at the decision-making process that led organizations and individuals to evacuate as well as the experiences of individuals during the evacuation process from the perspective of Emergent Norm Theory and the collective behavior research on panic. This paper will also attempt to gauge the impact of the 1993 WTC terrorist bombing on the evacuation process following the September 11 attacks.

Methodology

The research was conducted by analyzing first-person accounts of survivors of the event as well as general media reports. A total of thirty-five media reports were analyzed for this research. The two-week period following the disaster was when the information

was most relevant to most media sources. Later media coverage of the September 11 tragedies tended to focus on the economic, political, and social impacts of the attacks.

Immediately following the attacks, the Disaster Research Center (DRC) monitored the media coverage of the events. Researchers at DRC systematically collected articles on the event from the website of the major media sources—including *The New York Times*, *The Washington Post*, *CNN*, and *The Wall Street Journal*. In addition, DRC monitored the coverage of the events in other media sources. This paper utilizes the articles from this collection that focused on the evacuation process.

The accounts that yielded the most useful information for this study were in-depth interviews with survivors. Typically, these testimonies documented the survivor's experiences during the evacuation process, from the decision-making process to details about the flight from the building. While these accounts were very comprehensive, the subjects quite often had unusual (and, therefore, noteworthy) evacuation experiences. Probably the best example of a "newsworthy" but not necessarily typical account was the testimony of a window washer who was trapped inside of an elevator during the attacks (Dwyer, 2001). The testimony details a fascinating, but decidedly unique, survivor story: in brief, the man managed to free himself and others from the elevator by prying the door open with his squeegee and cutting through the drywall of the elevator shaft with the blade of the tool. Regardless of the unusual nature of this account and others, the in-depth testimonies provided the most complete overviews to date of the evacuation process.

The research also included articles that were composed of compilations of survivor accounts. These articles collected multiple survivor accounts in an effort to provide a comprehensive view of the experiences of survivors. The accounts that were compiled in these articles were occasionally lacking key information such as the

survivor's name, the name of their employer, and the floor number of the person's location at the start of the attacks. These accounts were more succinct than the in-depth articles on a survivor, and typically did not include information on the complete evacuation process. However, these compilations of survivor accounts appear to succeed in providing the "standard" survivor experience.

Finally, the research utilized some general articles on evacuation following the September 11 attacks. These articles ranged from specific reports on the evacuation of the WTC to articles that mentioned the evacuation in concert with other information. Because these articles were not specifically based on survivor accounts, the information that they provide on the evacuation process is limited. As with the articles that compiled survivor accounts, the survivor accounts in the general articles quite often omitted personal information on evacuees.

The Emergent Norm Framework

Emergent Norm Theory provides a very useful context from which to examine the evacuation process at the WTC. According to Emergent Norm Theory, collective behavior emerges from a normative crisis that justifies extra-institutional action. Turner and Killian (1987) provide an effective model for collective behavior that is rooted in an Emergent Norm approach. Collective behavior emerges from an event of "extraordinary circumstances." In response to this event, individuals interact in either pre-existing groups or impromptu collectivities (a process that is defined as milling). Such interactions result in keynoting, wherein the various members of the collective express various interpretations of the event. Turner and Killian observe that the keynoting process is essential to the development of emergent norms. It is through this process of trials and encounters that perceptions of feasibility and timeliness are developed. The

actors weigh these options and ultimately decide on a plan of action, resulting in collective behavior.

Clearly, the September 11 attacks can be viewed as the precipitating event that instigated the collective action of the building inhabitants. This paper will investigate the emergent norms in two aspects of evacuation: (1) the decision-making process that led groups and individuals to evacuate and (2) norms that emerged during the flight from the buildings. This analytical division emphasizes Turner and Killian's Emergent Norm Theory conceptual model. The decision-making process primarily focuses on the milling and keynoting process. An analysis of the emergent norms during the actual evacuation focuses on the collective action of the evacuees.

Emergent Norms in the Decision-Making Process

Because of the unexpected and extreme nature of the precipitating event, the survivor accounts gave particular attention to the decision-making processes that led them to evacuate. The majority of the survivor accounts indicated where the person was located and what activities they were engaged in when the attacks began. As a result of this almost universal focus on the precipitating event, the survivor accounts typically featured information on their actions and feelings in the time following the initial event.

Analysis of the survivor accounts of the decision-making process indicated that three key factors affected the decision to evacuate. First, the degree of milling and keynoting was related to the individual's social location at the time of the attacks. Second, building officials and others in leadership positions occasionally played a significant role in the decision-making process. Third, the level of the perceived threat of the attacks had a notable effect on the decision to evacuate.

Social Location: Milling and keynoting was a more evident aspect of the decision-making process if the survivor was within a pre-existing group at the time of the attacks.

The decision-making process was most significant when individuals were in the workplace and in the middle of their normal daily routines.

When individuals were in their pre-established groups, the decision-making process followed the established patterns of the organizational culture. In these cases, the organization decided to evacuate the premises *as an organization*. As a result, the decision to evacuate occasionally reflected the organization's typical decision-making process. Perhaps the most extreme example of this was described in the survivor account of Louis Lesce, a business employee that worked on the 86th floor of the north tower:

> (T)here was a huge explosion and the ceiling fell. I got out of that conference room and there were five other people on the floor and we decided to leave. But when we opened the door there was a black wall of smoke. So we closed that door right away, and we sat in the conference room and debated what to do. And then we decided to break the windows, and one of the gentlemen found a ball-peen hammer and then we said, 'Well, if we break the window what's going to be affected? Are we going to be sucked out? Is the smoke going to be sucked out or is air going to come in?' We had no alternative, so we broke the window and at that point glass flew in as well as hot shrapnel...and finally, about twenty minutes later, someone came up and said, 'We're going down' ("A Witness to the Destruction," 2001).

This passage is interesting for several reasons. First, the account clearly describes the milling and keynoting process. In the passage, several potential courses of action are offered and debated by the employees. Second, despite the presence of extremely dangerous and unusual conditions in the workplace, the employees entered the conference room and debated numerous options and the potential hazards. While the conference room may have been a "safe room" in the workplace, it also had symbolically represented the arena for "normal" decision-making. Third, the account indicates that, even when danger is apparent, the decision-making process can be extremely complicated and time consuming.

More frequently, the decision-making process was less complicated than the above account. Multiple survivor accounts indicated that their workplace's decision to evacuate was made almost immediately after the impact of the attack was felt. One survivor noted that the decision making process in her workplace was limited to an anonymous declaration: "Let's get the hell out of here!" (McGuire, 2001). Typically, however, survivors that were in the workplace at the start of the attacks reported the orderly assembly of employees and a general consensus that evacuation was the proper decision.[1]

Individuals that were away from the workplace at the time of the attacks typically did not mention a complicated decision-making process in their survivor accounts. In many of these cases, the individuals were in the "traffic areas" of the building (hallways, corridors, elevators, lobbies) at the time of the attack; therefore, the movement to the evacuation routes required minimal effort or deliberation. Overwhelmingly, these accounts seem to imply that evacuation was simply a logical reaction to the precipitating event. In fact, some of these survivor accounts connected the September 11 event with the 1993 WTC bombing and, as a result, the individuals evacuated immediately. Generally, individuals that were outside of their offices at the time of the attacks did not report that the decision to evacuate was a group process.

Another aspect of the social location perspective of emergent norms may be the *size* of the group that is considering evacuation. At the time of day that the attacks occurred, collectives of people in the workplace would be larger than the emerging collectives in the transitory arenas of the buildings (lobbies, cafeterias, etc.). Emergent

[1] In one interesting account, however, the company's CEO initially considered completing a memo before evacuating the workplace (Anderson, 2001). This example suggests that despite visual evidence of destruction (in this case, a glass window in the workplace was shattered by the impact) and an organizational decision to evacuate, the organizational routine may have influenced the decision-making process of some individuals or groups.

Norm Theory posits that people in large groups typically take more time to collectively act than people in smaller groups (Aguirre, Wenger, and Vigo, 1998).

Role of Leaders: A number of survivor accounts noted the influence that leaders had on the decision to evacuate. Turner and Killian (1987) identify the development of leadership roles in collective action as an aspect of the division of labor in collective behavior episodes. They observe:

> Although the solidaristic crowd acts under the influence of unifying symbols, not all the members behave in the same way. Some members act as leaders, exerting marked influence in the defining of the situation (p. 84).

In the case of the evacuation of the WTC, a "leader" is an authority figure that initiated the evacuation process. Types of individuals that constituted leaders in the WTC evacuation included floor marshals, firefighters and other rescue personnel, and building officials.

Unfortunately, while the role of the floor marshals is of particular interest to this research, analysis of media reports provided little information on their role in the evacuation process. Floor marshals, officials that were assigned to coordinate emergency evacuations in each floor of the towers (Jennings, 2000), were an important aspect of the WTC's emergency plans. Many of the survivor accounts failed to identify the specific role of the "leaders" that assisted them in the evacuation process. Because of their extremely well known uniforms, the firefighters and police officers were leadership positions that were easily identified by the evacuees. However, the efforts of the numerous building officials and fire marshals that assisted with the evacuation process were not specifically acknowledged by the survivor accounts.

In addition to these officially sanctioned leaders, it is important to note the influence of self-appointed leaders that committed themselves to the evacuation of others

in the buildings. Perhaps the most interesting leader of this type was Rick Rescorla, a former Vietnam Army Lieutenant who is credited with evacuating over 3,800 colleagues in the September 11 disaster. Using a bullhorn, Rescorla shouted evacuation instructions to workers from twenty floors. Rescorla, who tragically died in the September 11 attacks, performed a similar role in the evacuations following the 1993 bombings. During that earlier evacuation, Rescorla "mooned" his building mates in order to gain their attention before issuing evacuation instructions (Scavetta, 2001).

Level of Perceived Threat: A final factor that influenced the decision to evacuate was the perception of danger from the event. Quite simply, individuals were more likely to decide to evacuate the premises if they experienced visual or sensory clues that suggested the dangerous nature of the event. Examples of visual or sensory clues that were cited by survivors in their accounts included smoke, fire, water from the sprinkler systems, debris, structural failure, shattered glass, and the impact of the plane collision.

This observation is supported by the Emergent Norm Theory, which posits that the greater degree of perceived danger, the quicker the emergence of norms and the mobilization of participants. As Aguirre, Wenger, and Vigo (1998) note in their analysis of the evacuation of the WTC following the 1993 bombing, one proposition of Emergent Norm Theory is:

> The *greater* the search for meaning in the milling process focuses upon defining the situation as *serious*, the *quicker* should be the mobilization of people and the initiation of collective behavior. Similarly, the *greater* the degree of perceived *danger*, the *quicker* should be the emergence of norms and the mobilization of the participants (pp. 304-305).

Therefore, the more serious visual and sensory clues were more likely to initiate collective behavior and mobilization.

Survivor accounts suggested this connection between perceived threat and the decision to evacuate. As one survivor noted in his account, "Our lobby had a wall of

glass. And (the impact of the crash) blew out that wall. That's what said to me, 'Move!'" (Anderson, 2001). Other accounts linked the visual cue of bodies falling from the towers as a significant factor in their decision to evacuate. Perhaps the most common sensory clues that indicated to the evacuees the severity of the threat were the vibrations from the plane crash into their tower. Many of these survivor accounts initially believed that these vibrations were the result of a massive earthquake. A survivor in one such account reported standing in a doorway in order to remain safe during the "tremors" (New York Law Journal, 2001).

Unfortunately, the instinct to reach a safe zone sometimes conflicted with emergency instructions that instructed people to remain in the building. Survivors noted that these instructions came from both broadcasts over the building's intercom system and some building officials. This problem was particularly significant after the initial attack of September 11, as the inhabitants of 2 WTC were instructed to remain in their workplace despite their view of the damage to 1 WTC. These instructions provided incorrect information including reports that the fire in 1 WTC had been contained and that the threat was limited to that tower. Morgan Stanley employee Arturo Domingo, a survivor that ignored the instructions not to evacuate the building, recalled the statement of a building official, "His exact words were, 'Our building is secure. You can go back to your floor. If you're a little winded, you can get a drink of water or coffee in the cafeteria'" (Moss and Bagli, 2001). Later in his account, Domingo noted that many of his co-workers heeded these instructions.

Emerging Norms in the Evacuation Process

While the previous section focused largely on the role of milling and keynoting on the decision to evacuate, this section will use the Emergent Norm Theory to examine the evacuation process itself. In times of crisis and uncertainty, the existing definitions

of right and wrong are no longer applicable. The Emergent Norm Theory provides a conceptual framework that attempts to explain the development of these new norms. Turner and Killian (1987) effectively summarize the role of emerging conceptions of reality in collective behavior:

> Some shared redefinition of right and wrong in a situation supplies the justification and coordinates the action in collective behavior. People do what they would not otherwise have done when they (act collectively)...because they find social support for the view that what they are doing is the right thing to do in the situation (p. 8).

Several emerging norms were evident in the analysis of the survivor accounts of the evacuation of the WTC. First, helping behavior was a common element of the evacuation process. Second, the crowded conditions in the stairwells required the redefinition of several norms of social interaction. Third, there is some evidence in the survivor accounts that the unusual nature of the events of September 11 necessitated some behavior that would not normally be socially acceptable.

Helping Behavior: A large majority of the survivor accounts reported that helping behavior was common in the evacuation process. In particular, helping behavior was most common in emerging groups, or between strangers. Acts of heroism that were recounted in the survivor accounts include a construction worker who carried an asthma-inflicted woman to safety (Perrotta, 2001) and two men who carried a stranded, wheelchair-bound woman out of the building (Ritter, 2001). While the media devoted considerable attention to acts of heroism in the evacuation process, survivor accounts suggested a wide variety of helping behavior. One survivor noted that numerous fellow evacuees in the stairwells offered to carry his jacket or briefcase because he appeared to be exhausted ("A Witness to the Destruction," 2001). Other survivors recollected being offered bottles of water from complete strangers.

Defining Norms in the Stairwells: The conditions in the stairwells during the evacuation required the redefinition of norms for social behavior. While the aforementioned helping behavior could be classified as an emerging norm in the stairwells, the following types of emerging norms applied to social interaction in the crowded stairwells. These norms include guidelines for the evacuation process, the accommodation of the movement of emergency personnel in the stairwells, and the utilization of the lineup of people as a conduit for supplies and information.

Survivors noted that norms developed to guide the movement of people in the stairwells. Despite the crowded conditions in the stairwells, multiple accounts defined the evacuation process as orderly and calm. Survivor accounts include documentation of people calmly sipping coffee as they evacuated. One survivor noted that floor marshals established a strict "single file, no talking" policy in order to ensure a quick evacuation (Murphy and Levy, 2001).

During the evacuation of thousands of people out of the WTC, hundreds of emergency personnel were entering the building in order to fight fires and assist those that were in need. Because the width of the stairwells could only comfortably fit two individuals, there was very little room for the ascension of emergency personnel. Multiple survivor accounts stated that the evacuees quickly moved to the side in order to accommodate the occasional traffic of emergency personnel. Additionally, evacuees moved out of the way of emergency workers and other individuals that were assisting those with special needs or disabilities. In sharp contrast, the evacuees quickly reprimanded individuals that "cut in line" (Murphy and Levy, 2001). Finally, survivor accounts noted that the queue of evacuees was utilized to pass information through the stairwells or supplies into the building. One survivor observed that bottled water and paper towels were passed up the descending mass of people (McGuire, 2001). While

this particular emerging norm required minimal effort from its participants, the passage of knowledge and essential supplies in the stairwells served an important function.

Deviant Behavior as an Emerging Norm: A few survivor accounts described behavior in the evacuation process that, under normal conditions, would not be socially acceptable. However, these actions became acceptable as norms were redefined in response to the terrorist attacks. These actions were very rarely mentioned in survivor accounts, so they represent specific cases of deviant behavior rather than *types* of deviant behavior. One survivor witnessed firefighters using an ax to break into a soda machine in order to distribute beverages to evacuees (McGuire, 2001). Clearly, such an act of deviance can be framed as a small act of heroism in the context of the September 11 evacuations. Another interesting case involved the stairwell arrest of a man of Arabian descent despite the man's apparent lack of criminal behavior (Kleinfield, 2001). Clearly, the mere presence of a person of this ethnic background was considered to be suspicious in light of the attack on the WTC. It is altogether possible that memories of the 1993 attack may have influenced the decision-making process of the arresting officer.

The Case Against Panic

As the above section on emerging norms in the evacuation process indicates, panic was not a notable characteristic of the evacuation of the WTC following the September 11 attacks. Indeed, the collective behavior literature on panic observes that the phenomenon has not been empirically observed in times of crisis (Johnson, 1987; Johnson, Feinberg, and Johnston, 1994). As Quarantelli notes, the typical response to a crisis situation is marked by the maintenance of normative expectations and role relations (1957). Social order does not break down; in the case of evacuation, there is no unregulated competition for exits.

As in other disasters, the media continually invoked panic in the evacuation of the WTC. Yet, there is no indication of panic in the accounts of survivors.

In almost every survivor account, the individual noted that the evacuation process was marked by calm and civil behavior. When panic was directly mentioned, it was often contradicted elsewhere in the survivor account. For example, an evacuee would describe what he or she interpreted as "panic" in the evacuation process, and, in the very next sentence, the individual would discuss an example of helping behavior. Such statements suggest that the media's definition of the word "panic" has become ingrained into the public's view of disasters.

When the survivor accounts did mention panic, it was typically in reference to the reaction of people on the ground. As many of the survivors noted in their accounts, they did not fully understand the nature and magnitude of the crisis until they exited their building.[2] Accordingly, the perspective on the disaster from outside of the WTC added an undeniable element of emotion to many of the evacuees. Survivors typically mentioned panic in reference to groups of people fleeing from the area as the towers collapsed. However, such actions can more effectively be framed as actions of self-preservation than examples of panic.

Lessons Learned from the 1993 Bombing

The sense of calm and civility that defined the evacuation process may be linked to many of the building inhabitants' prior experience in the evacuation of the WTC following the 1993 bombings. In their accounts, many survivors observed that the September 11 event immediately brought back memories of the 1993 attack.

[2] However, some survivors did mention that the magnitude of the attacks was communicated to them either through telephone communications with friends and family or through the statements of emergency personnel.

In addition, many of the safety improvements that were made in the wake of the 1993 terrorist act played an important role in the efficient evacuation on September 11 (Berry, Landsberg, and Smith, 2001). As mentioned above, these improvements included the addition of battery-powered lights and glow-in-the-dark paint in the stairwells, the appointment of floor marshals to guide the evacuation process, and redesigned emergency plans. Many survivors cited the improved conditions in the stairwells during the September 11 evacuation. As one survivor observed, despite the magnitude of the recent terrorist attacks on the WTC, the evacuation process did not seem as dire as the evacuation following the 1993 attack due to the improvements in ventilation and lighting ("Ground Zero: Lawyers Who Made it Out Alive," 2001).

Survivors also mentioned the value of improvements to emergency plans following the 1993 bombing. The merits of these enhanced plans were demonstrated by the testimonies of individuals that started their employment at the WTC in the years following the 1993 bombing. An employee at Chartered International Bank in 2 WTC, learned of the location of the building's stairwells during a safety drill a mere month before the attacks (Vandiver, 2001). As noted earlier, a few survivors did face unexpected problems with their pre-ordained safety routes (most notably, crowded evacuation routes and blocked or collapsed passages). However, the survivor accounts suggest that evacuees were able to improvise around these obstacles in order to safely evacuate.

Conclusions

The research contained in this paper should be considered a preliminary analysis of the evacuation of the WTC following the September 11 attacks. The survivor accounts that were utilized in the analysis of the evacuation process cannot be considered a complete representation of the evacuee population. As noted earlier, many of these news

accounts were published due to their "newsworthy" nature rather than their presentation of the modal survivor experience. In addition, many of the survivor accounts contained vague and incomplete information about the evacuation process. Also, more complete information on the survivors themselves (such as their experiences in the 1993 bombings, the businesses that they worked for, and what floor they worked on) would provide an important context for further analysis. In order to truly study this important evacuation event, in-depth interviews will have to be conducted with a scientifically drawn sampling of survivors.

Based on this preliminary research into the survivor accounts of the evacuation process, the Emergent Norm Theory appears to be a useful theoretical framework from which to analyze the collective flight from the WTC. Indeed, many of the findings in this paper reflect the research of Aguirre, Wenger, and Vigo on the 1993 evacuation. In their article, "A Test of the Emergent Norm Theory of Collective Behavior," Aguirre, Wenger, and Vigo note that larger collectivities of people take longer to evacuate due to the nature of milling and keynoting (1998). The perceived threat of a disaster event also had an influence in both the 1993 and 2001 evacuations. As Aguirre, et al. observe:

> (W)e have shown that the transformation of people's interpretation of the relative safety of their environment brought about by the crisis is an important determinant of their collective behavior (1998, p. 317).

The preliminary research included in this paper appears to expand on an element of Aguirre, Wenger, and Vigo's study. In their article, Aguirre, et al. question whether or not the *type* of social relationships that exists in the evacuation process has a significant impact on the timing of evacuation (1998). This paper suggests that the enduring relationships in the WTC may have slowed the evacuation process. In particular, the organizational patterns and routine impact the decision-making process, thereby affecting the timing of evacuation. This observation could use further inquiry, however, as these

enduring groups were quite often larger than the emerging groups. Therefore, the impact on timing may be due to the *size* of the group more than the *social relations* that exist in that group.

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