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## A prospective longitudinal study of qualitative disaster narratives of highly trauma-exposed survivors of the Oklahoma City bombing nearly a quarter century later

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### Abstract

**Objective.**—To examine highly trauma-exposed survivors of the 1995 Oklahoma City Murrah Federal Building bombing nearly a quarter century later, focusing on survivors' immediate personal experiences of it through open-ended narratives.

**Methods.**—An original 182 bombing survivors, studied approximately 6 months post bombing, was randomly selected from a state registry of 1,092 bombing survivors, with 71% participation. Of the original 182 bombing survivors, 103 completed the longitudinal follow-up, conducted at a median of 23 years post bombing. Qualitative data for the follow-up study were collected using an expanded version of the Disaster Supplement to the Diagnostic Interview Schedule. Of the original sample, 39 were known to be deceased, 25 could not be located, and 15 declined participation.

**Results.**—In all, 12 themes were identified, but just 3 (Locations, Bombing experience, and Initial actions) are detailed here. All survivors were in heavily damaged buildings (about one-half in the Murrah Federal building) or directly outside, and the majority (84%) were injured. They described intense and gruesome experiences of the bombing, difficult efforts to escape to safety and help other survivors, and continuing postbombing experiences once outside.

**Conclusions.**—A striking finding was the intensity of the survivors' memories almost a quarter century after the bombing. Their sensory recollections remained vivid, generally as bright and intense as in earlier reporting periods. It may be that the salience of this extreme event stabilized memories of it yielding such vivid descriptions nearly a quarter century later.

### Introduction

Relatively few disaster mental health (MH) studies have prospectively examined survivors' terrorist attack experiences. Much of the short-term quantitative disaster research has focused on psychopathology, finding that a minority develop postdisaster disorders,

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including a ceiling of approximately one-third with PTSD (North et al., 1999; North & Oliver, 2013; North et al., 2011). Longer-term studies have shown that the earlier psychopathology may diminish over ensuing decades (Bosmans, Benight, van der Knaap, Winkel, & van der Velden, 2013; Bryant et al., 2021; Green et al., 1990; Lowe et al., 2020; van der Velden, Wong, Boshuizen, & Grievink, 2013), yet some psychopathology may persist (Adams, Guey, Gluzman, & Bromet, 2011; Arnberg, Eriksson, Hultman, & Lundin, 2011; Bland et al., 2005; Bosmans et al., 2013; Bromet, Gluzman, Schwartz, & Goldgaber, 2002; North & Oliver, 2013; Tucker, Pfefferbaum, Nitiema, Wendling, & Brown, 2016).

Despite the interest in psychopathology, there is much more of value in disaster mental health literature beyond this limited focus. Other broader aspects of disaster mental health of potential value may include descriptions of personal experiences of surviving a terrorist bomb attack. A useful means of obtaining this information is through qualitative research. However, almost no studies have obtained long-term qualitative data, and qualitative details of the experience of surviving a major disaster as long as a quarter century later are virtually nonexistent.

Therefore, the purpose of this study was to examine survivors' long-term recollection of disaster-related experiences and any newly emergent material in narratives described nearly a quarter of a century later. examine a highly trauma-exposed sample of Oklahoma City bombing survivors nearly a quarter of a century after the disaster to The Oklahoma City bombing was the most severe terrorist incident ever perpetrated on American soil up to that time. At 9:02 a.m. on April 19, 1995, a domestic terrorist detonated a homemade truck bomb right in front of the Murrah Federal building, blowing off the front half of the building, killing 168 individuals and injuring hundreds more. The explosion destroyed or damaged >800 buildings, incurring \$625 million in property damage. The data for this study extend beyond clinical psychopathology, providing rich information about survivors' immediate personal experiences of the incident through open-ended narratives. Earlier qualitative examination of this sample at about 6 months and a year later described their memories of these experiences but only through information by survivors recorded by interviewers. In the current study, audio-recorded data from survivor narratives collected >2 decades later provides more detailed and precise information.

## Methods

The original study of 182 bombing survivors was conducted approximately 6 months after the bombing. The sample was randomly selected from a state registry of 1,092 bombing survivors, with 71% participation. Details of the original study methods and sample are provided in an earlier publication (North et al., 1999). The follow-up interviews were completed at a median of 23 years (range, 21.5-24.3 years) post bombing. Of the original 182 bombing survivors, 103 completed the longitudinal follow-up; 39 were known to be deceased, 25 could not be located, and 15 declined participation. Causes of deaths were not obtained. Institutional Review Board (IRB) approval for the baseline study was provided at Washington University and the longitudinal follow-up study was by the University of Texas Medical Center IRB.

MH professionals formally trained on the study interview conducted the interviews. The Disaster Supplement (North, Pfefferbaum, Robins, & Smith, 2001) to the Diagnostic Interview Schedule (DIS-IV) (Robins et al., 1998), which has been successfully used on >1,000 survivors of disasters across all the categories of disaster typology including terrorism, was expanded in the follow-up study with an open-ended interview section asking participants to describe in detail in their own words their personal narratives of the bombing. Participants were allowed to provide as much or as little open-ended material as they wished. They were asked in a non-directive fashion to discuss their experience of the bombing in their own words, as well as how it affected them and their lives, including such aspects as injuries, emotional effects, how they coped with and processed the experience, and changes to the course of their lives and their views about meaning they found in it. Interviewer prompts were minimized to allow only spontaneous invitation to discuss any of the above aspects of their experience they did not already include, or to clarify anything that was not clear as originally stated. The qualitative section of the interviews was audiorecorded and professionally transcribed.

### Data analysis

Qualitative analysis for this study was conducted using ATLAS.ti qualitative software (ATLAS.ti Scientific Software Development, GmbH, Berlin, Germany). One member of the research team read the material and identified main themes represented in this material by preparing a list of separate topics most discussed in the transcripts of the interviews and creation of brief preliminary summaries of content to be included in them (12 in total, see Table 1). Next, pairs of researchers on the team independently rated passages and compared their ratings, achieving excellent inter-rater reliability for each theme as defined by a .80 Cohen's kappa statistic (Cohen, 1960; Fleiss, 1981; McHugh, 2012), achieving kappa values ranging .88-1.00. As part of inter-rater reliability efforts, the raters developed detailed definitions for inclusion/exclusion criteria for themes. Discrepancies in ratings were resolved through rater discussion, and final consensus was reached by research team discussion. After obtaining excellent inter-rater reliability, individual raters coded all of the qualitative text into themes, rating multiple themes for individual text passages as warranted, yielding a total of 4,958 total coded passages. Because the qualitative material was so voluminous, ratings within themes were grouped and subdivided into subsections. Table 1 list the themes with numbers of coded items in each theme and subdivisions of 3 themes. The content of the qualitative material is summarized in text, with accompanying illustrative quotes.

### Results

Of the 143 survivors not known to be deceased, 72% (N=103) completed the follow-up study. The follow-up sample was 45% (n=46) male, 88% (n=91) Caucasian, a mean (SD) of 39.0 (9.1) years of age, 34% (n=35) college graduates, 97% (n=100) currently employed, 69% (n=71) currently married, 84% (n=87) injured in the bombing, and 47% (n=48) had thought they might die in the disaster. In a multiple logistic regression model predicting completion of follow-up interviews (dependent variable) with independent covariates entered simultaneously including known deceased status at follow up and baseline variables of sex, age, minority race/ethnicity, college education, and married status, only

greater age was significantly associated ( $df=1$ ,  $\beta=0.05$ ,  $SE=.02$ , Wald  $\chi^2=5.57$ ,  $p=.018$ ) with noncompletion of follow-up interviews. Of the follow-up sample (combining both baseline and follow-up diagnostic data), 37% ( $n=38/103$ ) developed bombing-related PTSD and 36% ( $n=37/103$ ) developed MDD. The majority of the baseline survivor sample (69%) had received at least some MH interventions after the disaster, including 41% with formal treatment (16% treated by a psychiatrist) and 40% with psychological debriefing participation (North et al., 1999).

Table 1 lists the 12 themes and nearly 5,000 items coded within them, with brief summaries of the content of the themes. The themes with the most coded items pertained to injuries, fatalities, and medical care (18% of the content); the sensory experience of the bombing (17%); and thoughts and feelings about the bombing (12%). Because this article cannot address the total amount of material in all the themes, the content of only 3 themes (Locations, Bombing experience, and Initial actions) will be described in this article, with the content of the other themes to be covered in subsequent articles. This article covers the themes of Locations, Bombing experience, and initial actions. The selection of these 3 themes for this article was conceptually based to collectively represent immediate and early postdisaster personal experience of the bombing in narratives of this experience.

### Locations

This theme was among the smallest in terms of numbers of coded items ( $n=107$ , 2% of the total number of coded items) described by the survivors, and it included descriptions of where survivors were and what they were doing at the time of the bomb blast. The majority were in the Murrah Building or the Journal Record Building just north of the Murrah Building. Most of the survivors had recently arrived at their workplace in the morning. One narrative was that "...as I reached to punch the [Murrah Building elevator] button, that's when the bomb went off." Another stated, "I am sitting on the commode [in the bathroom], and the bomb goes off." Another survivor described, "I was on my way to the 9<sup>th</sup> floor, which if I had gone, I would not be here today." Yet another survivor stated, "I was only maybe 2 or 3 feet from the edge of where the building collapsed."

### Bombing experience

This theme was large in terms of numbers of coded items ( $n=825$ , 17%). Many of the participants became tearful while discussing this information.

**Immediate setting of the bombing**—The first information provided the short timeframe before the bombing. Survivors described what seemed to start out as a "normal day" heralded by a bright and beautiful morning, as epitomized by one particular comment: "As I drove to work, I remember it was a beautiful day, calm weather, saw the sunrise as it was coming up, beautiful sky, no clouds in the sky hardly at all, some to the east, but overhead was clear, beautiful blue, and as the sun came up, it had some red colors in it and sunrise yellows." A few individuals were spared from being killed or seriously injured in the bombing because they were late to work or involved in activities in less damaged areas of the Murrah Building.

There were 26 comments about seeing the bomber and his truck right before the bombing, e.g.: “I remember seeing the Ryder truck, wondering why they were not in the underground parking garage;” “if you were moving stuff around, you’d want to put it in the basement....I thought it strange that there was a truck there.” Another survivor commented, “How unsatisfactory it was that he had parked his truck in a loading zone instead of finding a regular parking space, and also that he ran away from the building and didn’t go into the building? So it just didn’t make sense to me.”

**Sensory experience of the bomb blast**—The sound of the bomb blast was described by many survivors in remarkably similar versions of “the loudest noise I had ever heard in my life” and “deafening.” There were comments that school children in survivors’ families heard the boom in the next town away. One survivor’s description was, “If you can imagine what it would sound like if Mount St. Helen’s exploded and you had been right next door to it, or a jet airplane had exploded, I mean, it was a huge noise, and it just seemed to last forever.” Another survivor said, “It sounded like a roar, and it lasted a long time...[like a] horrendous torrential tornado that’s blowing through this room, along with this roar.” The bomb blast also came with brilliant light: “There was just a great, brilliant light, that it would be so bright...it was whiter than white, and that light seemed to surround you.” There were many descriptions of sensations of the bomb blast. “The floor was shaking, and it felt like an earthquake.” “If I could describe the feeling of it, it was kind of like somebody had picked the building up and dropped it.” The bomb blast seemed to continue for a long time, as reflected in several comments. “It seemed like it went on forever,” “quite a long time, maybe 10 or 15 seconds.” “It went on so long I was thinking, ‘What is this?...When is this going to end?’” One survivor stated, “I have a clear recollection of lying there on the floor with those successive shocks and wondering what it was and wondering how long it would last.”

**Collapse of buildings**—The impact in the Murrah Building was massive. Several comments provided descriptions of the sounds and sensations of the building collapsing. “I was about 2 or 3 feet from the support columns that did not collapse on the building, and so what happened next was that I could feel the building begin to collapse...I could hear the floors coming down on top of each other.” “The whole room just began to fall apart...I remember seeing...part of the ceiling start coming down, and then there was a violent shaking of the room, a lot of loud noise, which I later learned was the pancaking of the floors as they fell together, all 9 floors. And that was very loud and disturbing.” The sounds of the floors collapsing were specifically described as, “I heard this whap, whap, whap, whap, and I found out later that was the floors falling” and “You could even hear the sound, “chick, chick, chick, chick.” People were thrown about: “I saw a man fall through the ceiling.” “The pressure and everything, it was sucking—it was blowing me toward the window.” “I was knocked about 20 feet...and when I stood up, that’s when I heard the sound.” “The impact of the building collapsing just a few feet from me threw me out of my chair and threw me face first into the west-most wall of the building, and that impact fractured my skull.” “The blast threw me about, oh, 8 or 10 feet....Part of the Ryder truck cut both my legs to the bone....And the floor that we were standing on fell a couple of feet. It didn’t completely collapse. The floor above us fell on us.” “Everybody was knocked to the floor. It literally tore the clothes off one of the guys....shredded, torn off of him.” There

were numerous descriptions of glass flying everywhere, resulting in extensive lacerations. “The windows—we had a whole wall of windows...the kind of glass that shatters [and] it was just like being pelted with thousands of...small pieces of glass.”

**Thoughts of being killed**—In the immediate aftermath of the bombing several survivors believed they were going to die. There were many different personal responses, ranging from acceptance to defiance: “I thought maybe I’d be dying in the next few minutes,” “I just felt relieved and at peace, and I was waiting to die,” “I’m going to die up here, and I never said goodbye to [my family], I never told them I loved them this morning,” “I could feel that in my soul and in my body that I was dying, and that if I didn’t take action that something would happen, that I would die,” “All of a sudden there was just kind of a calmness over me saying, ‘I can’t die, I can’t die today. I have too much to do,’” and “As soon as I prayed, the peace of the Lord settled over my heart, and the fear left me just as quickly as it came.” One survivor stated, “I was thinking to myself if I die in here, my wife is going to kill me.”

**Postbombing destruction**—Survivors reflected on the immediate aftermath of the disaster as “apocalyptic.” “I thought the end of the world was coming.” One survivor recalled, “I remember looking around...absolutely nothing looked familiar. It was as if all of a sudden you had no perspective on where a door was or where a hallway was or where the office to the north or to the west of us.” The unbelievable had occurred: “You could see sky, so whoever was on our floor area was under tons of concrete, and that reality began to fit in.” “I looked to my south, to the south wall, and noticed I could actually see daylight, which I shouldn’t have been able to see daylight, because it used to be a solid wall.” “Part of the bathroom was gone and it was in what they called The Pit with remains of bodies, because all those floors had fallen on everybody.” “I remember getting out of the back of the building. There was only one stairwell you could go down; the other stairwell disappeared.” “The stairway was gone, and there was glass everywhere. And I looked out over the floor of the 5<sup>th</sup> floor, and all I could see was the basement, so I couldn’t jump down there.” One survivor described walking “along the edge looking down into the crevasse, the floors that had dropped, to see if I could see anyone down there.” Another described “horrible sounds, horrible smells, people calling out by that time for help, the desperate tones of their voices.” One terrible memory was that “you could hear the babies from the daycare crying.”

**Immediate injuries and fatalities on scene**—Descriptions of immediate injuries and fatalities were gruesome and severe. There were several narratives similar to the following: “Concrete was up to my waist, so I had to remove all the concrete off my legs...then I looked at my left leg, my knee, and I could see my bone hanging out of my knee.” One survivor stated, “I could hear people screaming, and I could hear this woman screaming right in my ear, and then I realized that was me, that was my voice; I was screaming; I just didn’t recognize the sound of my voice.” One comment was, “All of a sudden we see this guy raise his hand, and he says, ‘I’m not okay.’...This guy had fallen to our floor from the 7<sup>th</sup> floor. Now, what he landed on or what cushioned him I’m not sure. But, anyway, he was able to get up.” A tragic incident was “A man who was in the Murrah Building...was sitting down kind of on the floor whatever, but he had no legs, he had no legs at all and he was crying and he was screaming for help.”

One survivor was told, ““You’ve got blood coming out of your head. You need to take your shirt off and make a bandage and put it on your head, because it’s bleeding pretty good””...and I did that, and then we started trying to figure a pathway out over the debris.” There were many descriptions of people bleeding heavily, including, “a lot of really injured people [with] glass injuries....a lot of people bleeding heavily” and “people were beginning to come out of the buildings with blood and debris all over them and wounds, and people were screaming and crying up and down the street.” Some survivors described “walking past people that were bleeding, and we were all in a daze”, and one observed a man who had been cut up from the glass from the buildings who appeared to be “just a red blob walking down the street.” One survivor recalled, “The ambulance was full...they couldn’t lay me down...they said I looked like a porcupine with stuff sticking out of me.” In addition to lacerations, survivors described burns: “A lot of women were coming out with their dresses...on fire, they were burning.”

Several survivors encountered dead bodies and body parts at the scene: “There were a lot of dead people, and there was a lot of blood and a lot of people that were clearly not going to live, or were dead,” “You could tell they were dead because they didn’t have any skin. I mean, their limbs were gone,” and “I remember seeing numerous body parts laying on the sidewalk, arms, legs.”

**Subsequent bomb scares**—There was at least one bomb scare related to the possibility of an additional bombing in the early hours of the rescue operation. People being rescued had to be left alone because the rescuers were required to clear the area: “I had 45 minutes to lay there waiting for another bomb to go off...life flashing before my eyes, just thinking about my life and everything and regrets, wishing that I had a second chance. And there was not a second bomb.”

**The disaster scene outside the buildings**—As people emerged outside, they were appalled to witness the catastrophic scene. The Murrah Building was heavily damaged: “The whole front of the Murrah Building was gone,” “We...saw half of the Federal Building gone,” “The whole front of the Federal Building was down,” “most of the building was gone” and “the whole side of the building was blown apart to where you could just see the inside of the building on every single floor.”

The bomb caused extensive damage beyond the Murrah Building. Concrete blocks, flames, and glass were scattered over many blocks. “The cars in the parking lot across the street from the Murrah Building started exploding and black smoke appearing everywhere.” “All you could see from the Murrah Building was just this black cloud. One survivor reported that “the southeast corner of the building was broke off, and there was big chunks of concrete laying in the middle of the street, and concrete debris everywhere.” Another survivor explained, “The explosion had been so large that just huge pieces of brick and concrete and stuff had been hurled great distances.” Additionally, “the electrical lines were popping everywhere.” Heavy damage was inflicted on cars parked in adjacent parking areas: “All the cars...across the street from the Federal Building [were] either on fire or blown to pieces” and “The cars in the parking lot were totally in flames, and the tree there, what they now call the Survivor Tree, was in flames.”

Flying debris and window glass flew dangerously and piled up on the streets outside: “There was just glass falling everywhere, windows. I remember looking up at the sky at one point, and you could just see window blinds flying through the air, whole windows falling down and crashing,” “Glass kept falling down on our heads out of the building,” and people were walking over “about 3 inches of glass.” Survivors described the glass covering outside surfaces: “all the glass on the ground and the sun was just hitting it and it looked like there were little rainbows coming up from the street which was really pretty,” “The street looks like it was filled with diamonds, it just glistened because of all the shattered glass,” and “It was the most beautiful sight you’ve ever seen, sparkling glass on the road, like snow, but it was just glass.”

Outside, there were “people running everywhere” and “people screaming,” “just thousands of people everywhere, pretty much just chaos.” One survivor noted, “I remember seeing police cars, but all of their tires were flat because they had driven through all the debris to try to get close to the scene of what turned out to be the bombing.” Another survivor speculated that “One of the first things that I thought was, I guess we’re not going to be working tomorrow.”

### Initial actions

This was a fairly large theme in terms of numbers of coded items (n=522, 11%). It began with a description of efforts to escape the danger extending through the early postbombing period.

**Efforts to escape the danger**—Several people described crawling to seek safety: “I crawled over the debris and headed toward the light.” A trapped survivor stated, “They counted to three and pulled, and it hurt, but I came out from under the rubble and looked around for the first time, and it just looked like something out of a movie. Another survivor heard “a voice...’Oh, Jesus, help me, help me, Jesus, help me.’ And my legs wouldn’t walk that way. I couldn’t move....I literally fell to my knees trying to crawl in that direction, and I couldn’t go any closer to that area, and she just cried...’Somebody, anybody, Jesus, help me.’” Others were able to help people get out: “I began to search the floor to make sure that everybody was out” and “I got up, made sure my employee was okay, and went out into the open area where my staff were, and said, ‘Everybody get up. Let’s get out of the building right now.’” It was not always possible to get people out: “There was a woman who was just at a slightly lower level than we were, and I was trying to check on her, and she was not there.”

Efforts to seek safety were intense. “It took maybe 20 seconds for me to get out of the building, but it seemed like forever.” “When I got into the stairwell, it was just jammed with people trying to figure out how to get out.” “I just remember thinking, we’ve got to get out of here. We’re going to die.” The means for survival and escape were not always obvious. “I said, ‘Be close to a post, because we may have to hang on if this floor falls,’ ....We had no idea which way to go.” Trying to escape was perilous: “I remember them telling—everybody saying, ‘Watch the wires.’”



“We went to turn to our right where the exit would normally be, and there was just smoke pouring through the building, there was water pouring down this dark stairwell...it was very scary going down this stairwell while water was just pouring down the steps.” “We had water coming up to our ankles, very cold water, and then the walls exploded.”

Many potential escape routes were not passable. “I went to my front door...it was blocked.” “We went to go to the hallway and go outside, and it was blocked.” “We couldn’t get out the door so we actually climbed back out the windows that had just blown in on us” and “some people were jumping out windows.” One survivor observed “a young lady...started to climb out on the window ledge to jump out of the window, so I went over and pulled her back in.” Another reported, “All of us got out of the building through the windows. All of the glass in that building, every bit of it, had been blown completely out, so we were able to scoot down a little cement incline just outside our office, down to the roof of the 2nd floor, and we were able to get all of us out.” Others had to escape windows using firefighter ladders, “maybe 15, 20 feet from the first floor to the outside of the building., and they put the ladder on top of all the concrete, so we had to climb ...on top of the metal cabinets and onto the concrete and onto the ladder.”

**Experience upon reaching the outdoor disaster area**—The terror and horror did not end after survivors’ emergence to the outside from the disaster site. “I got out. I was very disoriented, and I didn’t know what to do.” Upon arriving outside, many survivors sat down on the street curb, and others gathered in the plaza. Several described feeling very cold. Many survivors were obviously injured, and ambulances were taking them to hospitals. People were speculating about what had happened. Workers began gathering and trying to account for their office coworkers. Many survivors found that their cars were destroyed or too damaged to drive.

Several survivors described attempts to return inside into the bombing site to retrieve people or belongings such as briefcases and wallets. “We ran back in the Federal Building, running from floor to floor in the bathrooms yelling for people” and “When I went back inside the building, I saw the kid that I had with me, and he was in shock, so I grabbed him.”

A number of survivors walked away from the scene, some of them several miles, many attempting to ambulate to their homes. There were different behaviors upon leaving the bombing site: “I went home and the first thing I did, I wanted to take a bath because I had glass all over me and dirt and debris and I just wanted to get it off and clean myself up, then I got dressed and I went back downstairs and I was just glued to the television set,” “I got home, and I just kind of laid around,” and “A bunch of us got together and went to...happy hour...had some drinks.” “Several of us went up North Oklahoma City to get some wood just so we could re-board our windows.”

**Connecting with loved ones**—There were many worried relatives and friends with whom most of the survivors were able to establish contact via telephone and relay their security in short time, but many of these relatives had been very concerned when they saw the news of the bombing in the media. Most were able to make in-person contact with their loved ones within a few hours, and those hospitalized with injuries were able to join one

another there. Most of the personal reunions were filled with long hugs, and there were some receptions of joy from groups of loved ones.

**Return to the bombing site and workplaces**—Initial return to the bombing site was very difficult for many. A survivor observed, “One husband came and stood next to his wife: “They both just stood there and cried.” Another anecdote described was, “I looked over at him and I said, ‘You know, we’re all going to know somebody that’s dead in there.’” A comment described by another survivor was, “Looking at the building, the Murrah Building...she said, ‘My baby. My baby is in there.’”

Early return to work immediately after the bombing was difficult and painful. “The next thing we did was get up and go to work the next day” and a need to “treat the day like it was any other day and do what we could do at work and get the building cleaned back up.” “We...started calling people...and telling our customers, ‘we want to let you know this isn’t going to affect our business; we’ll still do business as normal.’” “We met at the Journal Record Building, and we formed teams to go through the building and collect important information to do our work.” Other survivors had more difficulties: “I kind of went back to work, but I didn’t do...much real work. I don’t think they really expected me to do a lot...Most of the time, people just sat around and talked about the bombing.”

## Discussion

This is one of the longest prospective longitudinal studies of personal narratives of exposure to terrorism ever conducted, and it uniquely used a qualitative approach, providing rich, detailed qualitative information. It included information on the locations of survivors during the bombing, sensory experience of the bombing, and initial actions. In this study focused on personal narratives of the immediate bombing experience, psychopathology did not emerge in the discussions. In part, this reflects the known course of disorders such as PTSD and MDD that cannot be diagnosed until more and a month and 2 weeks respectively, longer than the time course in this study’s data; therefore, content reflecting these disorders would not be expected to be found in these disaster narratives. It was other content that comprised the most compelling findings.

In the current study, the intensity of the survivors’ memories almost a quarter century after the bombing was striking. Their sensory recollections (sounds, sights, smells, sensations) remained vivid, reflecting much of the material from the early study (Dang et al., 2022). The memories of these survivors nearly a quarter century later seemed as bright and intense as in their narratives in the first year and continued to portray the general stories recounted early on. These people had arrived at work on a beautiful, normal-seeming day that suddenly turned chaotic. The devastation of the workplace was astounding, the injuries were extreme, the many fatalities were horrific efforts to get out of the danger entailed many difficulties, and the immediate aftereffects were difficult for the survivors.

The literature examining effects of memory for traumatic events, including disasters and terrorism specifically, has suggested that memories may remain accurate, detailed, and vivid over time (Bohannon, 1988; Brown & Kulik, 1977; Conway et al., 1994; Cutshall &

Yuille, 1989; Norris & Kaniasty, 1992; Pillemer, 1984; Sotgiu & Galati, 2007; van Giezen, Arensman, Spinhoven, & Wolters, 2005), although potential for distortion and inaccuracies of memory for traumatic events over time have been examined as well (van Giezen et al., 2005). Personal exposure to trauma has been found to be associated with heightened memory for the event (McKinnon et al., 2015; Neisser et al., 1996). Studies have found that emotion does not negatively affect memory. These findings are relevant to the current study because this study examined disaster narratives over time, the sample was highly trauma-exposed, and survival of this event was found to be a highly emotional experience (Abu-Hamad, Pollio, Moden, & North, 2022). This literature, however, largely pertains to memories of disaster and trauma studied in early postdisaster periods; the current study provides new impressions of survivors' personal disaster stories as recounted nearly a quarter century after a terrorist incident. This study furthered the conclusions of the earlier studies by demonstrating that these survivors had vivid, detailed, and intense recall of their immediate bombing experience after a protracted length of time passed.

The most obvious strength to this study is the length of the prospective longitudinal postdisaster follow up of almost a quarter of a century. Another is the random selection of the sample with relatively high participation rates (71% at baseline and 72% of non-deceased survivors at follow up with attrition bias involving only greater age). Earlier qualitative study of this disaster cohort simply used paraphrases of responses to questions recorded by hand by interviewers (Dang et al., 2022), but the current study had audiotaped and professionally transcribed answers to an expanded qualitative interview about their disaster experience. This study provided much detail of survivor narrative memories.

To manage the enormous volume of survivor descriptions of their bombing experience, only 3 themes were covered in this article. These 3 themes were selected for inclusion in this article because they provided narrative accounts of the most immediate bombing experience. The other themes will be covered in detail in separate subsequent articles. A potential study limitation is the number of years since the disaster, allowing for distortion or diminution of memory; however, the salience of this extreme event may well have stabilized memories of it yielding such vivid descriptions nearly a quarter century later. This study was conducted with only 1 disaster cohort of 1 disaster type (terrorism) in 1 site, potentially limiting its generalizability to other disasters. Importantly, this study did not link the qualitative responses with diagnoses of postdisaster psychiatric disorders, and thus it did not examine the association between elements of the narratives and psychopathology such as PTSD.

These findings suggest that memories of exposure to a terrorist attack remain vivid over a lifetime. Although diagnosable psychopathology such as PTSD and MDD may improve over time, strong memories of the trauma appear to remain. These memories do not necessarily represent psychopathology, because they may be normative after such extreme events. This material may be particularly helpful to help educate clinicians and others about the first-hand and inside view of such a rare experience such as surviving a life-threatening terrorist event, so that they may approach interactions with such survivors with some baseline knowledge of what can be expected in survivors' experience. This level of understanding is not available in quantitative data.

This study has reinforced the accounts of harrowing and intense disaster experiences described by survivors in immediate and early postdisaster periods; it has also further demonstrated that such memories are longlasting, their vividness and clarity not degraded with time. Because the memories remain so strong for so long, they can fuel longstanding emotions and behaviors that could be the focus of long-term therapeutic interventions. It is important for clinicians to appreciate that although memories of the event may still be fresh in survivors' memories so long after a disaster, these memories may not necessarily indicate psychopathology. Although vivid memories of such salient and extreme events could be the basis for posttraumatic intrusive recollection symptoms, they might also occur within the natural course of memories carried over time. These vivid memories may provide avenues to explore cognitive and emotional processing of terrorism long term. It is appropriate to address potential psychopathology with full diagnostic assessment. Once this is accomplished, the meaning of longstanding memories and potential for further healing can be further addressed in the appropriate context. Conducting this study showed that even decades later, survivors of terrorism were still wanting to discuss their experience, and for some, the opportunity to talk about it may in itself provide some therapeutic benefit. It is through these longstanding memories that further cognitive and emotional processing may occur personally by survivors and/or be guided by clinical interventions.

Obviously, further studies are needed with long-term postdisaster follow-up samples to replicate these findings and examine associations of these memories with personal characteristics. Additionally, research is needed that specifically compares and contrasts recollections of immediate and early disaster experiences from the points of view of interviews in the first few postdisaster months with descriptions of these disaster experiences related nearly a quarter century later to examine the effects of the passage of decades on recall. Future studies are needed to link qualitative narrative findings with diagnoses of PTSD to examine potential roles of psychopathology in long-term narrative memory.

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## Biographies

Dr. Carol North has served as Medical Director of the Altshuler Center for Education & Research at Metrocare Services in Dallas, Texas for the last 7 years. Holding The Nancy and Ray L. Hunt Chair in Crisis Psychiatry, she is a board-certified psychiatrist and Professor with tenure in the Department of Psychiatry at The University of Texas Southwestern Medical Center in Dallas, Texas where she held the position of Director of the Division of Trauma and Disaster. Dr. North completed medical school and residency training in psychiatry at Washington University School of Medicine in St. Louis, Missouri, followed by a NIMH postdoctoral fellowship and a Masters degree, both in psychiatric epidemiology, at the same institution. Dr. North has been an international leader in shaping the science of disaster mental health, continuously conducting federally funded research for more than a quarter of a century, and has studied 3,500 survivors of 15 major disasters of all types.

Katy McDonald is a research coordinator for Metrocare's Altshuler Center for Education and Research (ACER), a premiere training and research institute for community mental health professionals across the State of Texas. Ms. McDonald coordinates and administers research study associated activities. Assists in project planning, and ensures that pre-established work scope, study protocol, and regulatory requirements are followed. Recruits and coordinates research subjects, as appropriate, develops and maintains recordkeeping systems and procedures. She graduated with a Masters in Human Relations and is licensed as a professional counselor.

Dr. Alina Surís was a Professor of Psychiatry at the University of Texas Southwestern Medical Center, retiring from this position as well as her position at the Veterans Affairs North Texas Health Care System where she was the Chief of Psychology and a funded Senior Research Psychologist. She has several research interests and publications including the nosology of mental illness with a focus on PTSD, the assessment and treatment of Military Sexual Trauma (MST) and combat and disaster-related PTSD, and evidence-based and novel interventions for treating PTSD. She has won many awards for her research including the Gerald R. Klerman NARSAD Young Investigator Award and the American Academy of Clinical Psychiatrists' George Winokur Award, twice. She is the Past President of the American Board of Clinical Psychology and their Past National Examination Coordinator, and served on the Executive Committee and the board of the Board of Trustees of the American Board of Professional Psychology for 13 years. Dr. Surís is a Fellow of Division 18 of the American Psychological Association, being recognized for her contributions to the understanding of Military Sexual Trauma (MST) and evidence-based treatment of women and men with PTSD.

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**Table 1.**

Themes and numbers of items coded within them

<b>Theme</b>	<b>Summary of content</b>	<b>% (N)</b>
Location	Where survivors were located when the bomb blast occurred	2% (107)
Bombing experience	Details of the experience of the actual bomb blast beginning with the setting and including sensory experiences, physical impact, and the immediate post-bombing scene	17% (825)
Initial actions	Early responses to the bombing by survivors and their loved ones, beginning with escape from danger and extending through the early postdisaster period	11% (522)
Assistance received and given	Help provided to survivors by rescue personnel, family and friends, the workplace, and the community, beginning at the disaster scene and continuing into the early postbombing period	9% (468)
Injuries, fatalities, and medical care	Descriptions of specific physical and psychological consequences with details of medical care provided	18% (911)
Losses	Loss of life and property, financial and economic consequences, and general losses	2% (112)
Workplace issues	Descriptions of the postdisaster workplace, including temporary and new offices and effects on jobs and careers	6% (302)
Authorities and media	Perceptions of the responses of government, authorities, and celebrities, and experiences with disaster-related media	4% (192)
Relationships	Positive and negative effects of the disaster on workplace, family, and friendship relationships	3% (154)
Thoughts and feelings	Disaster-related cognitions and emotions reflecting on the experience of the event	12% (600)
Coping	Means of addressing personal effects of the bombing, including use of substances, professional care, support from family, friends, and the workplace, and memorialization	8% (417)
Making meaning/ perspectives	Philosophical and religious aspects of making meaning of the disaster experience	7% (348)
<b>Total of above</b>		<b>100% (4958)</b>



**Table 2.**

Themes and groupings of items within them

Theme	Column totals (n of items coded)				
<b>Location</b>					
Murrah Building				36	
Journal Record Building				38	
Water Resource Building				14	
Other location near Murrah Building				17	
Home (very close to bombing site)				2	
<i>Total of above</i>					<b>107</b>
<b>Bombing experience</b>					
Before bomb blast					66
Ordinary morning				38	
Saw perpetrator				28	
Sound of bomb blast					94
Heard it				64	
Did not hear it				30	
During bomb blast					121
Immediate post-bombing scene inside				188	
Injured/dead				80	
Bomb scare				17	
Immediate post-bombing scene outside				234	
Medical assistance				24	
<i>Total of above</i>					<b>825</b>
<b>Initial actions</b>					
Post-bombing actions					475
Efforts to escape/rescue				188	
After exiting/emerging to outdoors				140	
Went back into building				16	
Later (after leaving bombing site/going home)				26	
Worried relatives				10	
Contacting loved ones				95	
<i>Initiating telephone contact</i>			74		
<i>In-person contact, queries from loved ones</i>			21		
Homecoming/family reunion				24	
Upon seeing the site				7	
Early return to work				16	
<i>Total of above</i>					<b>522</b>