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IMPROVISATION, CREATIVITY,
AND THE ART OF
EMERGENCY MANAGEMENT

James Kendra
Tricia Wachtendorf

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Improvisation, Creativity, and the Art of Emergency Management¹

James Kendra, Ph.D.
Emergency Administration and Planning Program
Department of Public Administration
University of North Texas

Tricia Wachtendorf, Ph.D.
Disaster Research Center
Department of Sociology and Criminal Justice
University of Delaware

Improvisation is a significant feature of every disaster, and Tierney (2002) has argued that, if an event doesn't require improvisation, it is probably not a disaster. Improvisation has had something of a checkered history in the emergency management field since its appearance in a disaster response seems to suggest a failure to plan for a particular contingency. Even scholars who have recognized the value of this capacity have tended to subordinate it to planning. Kreps (1991: 34) for example, who has completed some of the most detailed studies of organizational improvisation in disaster, has defined improvisation as organizing "during an event," while preparedness is organizing "before an event." He has stressed that preparedness and improvisation are the "foundations" of emergency management (31), yet he nevertheless privileges preparedness, especially planning, as the favored element. Drabek (2001) too emphasizes the need for planning to reduce the incidence of (the inevitably necessary) improvisation. Thus improvisation occupies a somewhat conflicted space in the realm of emergency and crisis management capacities: we plan in detail so that we don't have to improvise, knowing that we will have to improvise.

This paper discusses emerging understandings of improvisation in emergency management and their relationship to planning as well as to other such noted disaster phenomena as emergence, or the appearance of new groups of people organized to meet disaster-related needs. We reconsider the suggestion that improvisation must be positioned with respect to planning in such a way that it somehow seems to be the weak link, or an indication of some failure or dysfunction. We argue that improvisation is a distinct capacity that individuals and groups employ, and that while planning encompasses the normative "what ought to be done," improvisation encompasses the emergent and actual "what needs to be done." The public policy scholar Michael McGuire has suggested that "plans are hypotheses" about a projected future condition. Since real conditions are likely to differ, adjustment to plans will always be necessary. Weick (1998) has drawn on jazz as a model and lens for understanding improvisation in

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organizational settings. Jazz musicians are not censured for their improvisations, nor are they criticized for not composing their scores in advance. Rather, their extemporaneous compositions are celebrated—that's what jazz *is*, and a successful jazz performance is the end result of training, knowledge, practice, and experimentation. Similarly, improvisational comedy and theater are regarded as high expressions of a stage performer's art. This doesn't mean that these performers do not practice or build repertoires of material that they can draw upon in given circumstances. On the contrary, they work to build their knowledge across a range of fields, and this knowledge provides the elements for each improvisational outcome. Improvisation plays an equally important role in emergency management, where training, practice, and knowledge of both the field and the community serve as repertoires of material emergency managers can draw upon in the ambiguous and dynamic conditions of a disaster where not every need has been anticipated or accounted for (Wachtendorf, 2004, Wachtendorf & Kendra, 2005).

Scholars and practitioners often define emergency management as both an art and a science (see, for example, Rubin, 2004), an understanding that applies to other professions where people interact with the natural environment. For example in medicine, a specialty routinely also described as art and science, the environment is the highly localized one of a patient's body; in navigation and aviation the environment is the natural one of ocean basins, the atmosphere, land forms, weather, and climate. But in emergency management, the setting is even more complex, consisting not only of the earth's processes but also humanity's industrial activity and the distribution of people and their complex social and economic systems, systems that are imperfectly understood even in normal times yet whose ramifications extend into, and even create, the situations we colloquially call disasters. For the emergency manager, the science extends from the social and natural sciences that provide the foundation for understanding the causes and distribution of hazard. The earth and atmospheric sciences tell us about geologic and climatic processes; the social sciences tell us about people's understanding of and response to those processes and moreover provide insight into the social systems that lead to exposure to forces of nature, or that lead to mismanagement of our industrial systems resulting in systems failure, hazardous releases, and environmental degradation.

But more can be said about the science of emergency management, for though it involves applications of principles from various disciplines, its practice is a particular kind of science, one that leaves behind standard methods and well-defined procedures of its foundational disciplines to become something more rooted in interpretation, judgment, and the negotiation of ambiguity. Funtowicz and Ravetz (1992) have identified various forms of scientific practice. They distinguish between Kuhnian "normal science" where scholars work within established norms and sets of procedures, and "post-normal science," characterized by problems both with high uncertainties and high decision stakes, where issues are often ill-defined, proper methods unclear, data mixed or incomplete, and social and political considerations intermixed. Environmental challenges such as global warming are "post normal," for example. Funtowicz and Ravetz (1992) also identified a middle ground of moderately high decision stakes and moderately high

uncertainty, a conceptual zone requiring the application of professional craftsmanship, as is required in the various engineering disciplines.

These are also the characteristics of emergencies, where the precise unfolding of circumstances is unknown. As in other disciplines, the art is in the application of knowledge in irregular circumstances, where we encounter the genuine evolving of actual events, not an idealized type. "Science deals with regularities in our experience; art deals with singularities" (Weinberg, 1985: 60). Singularities are the elements of disaster not predicted in advance. Weick (1998), in reviewing recent management theory, noted that all management is improvisation to some extent. If that observation is valid for organizations in commercial enterprises where decision making scenarios that are often described as "dynamic" are ponderous as compared to crisis management time scales, then surely improvisation would seem to be elemental in emergency management, too. Given this, we suggest that improvisation is a high expression of an emergency manager's art.

Scholars have defined improvisation variously, and Weick (1998: 546-547) provided an often-cited definition:

Considered as a noun, an improvisation is a transformation of some original model. Considered as a verb, improvisation is composing in real time that begins with embellishments of a simple model, but increasingly feeds on these embellishments themselves to move farther from the original melody and closer to a new composition. Whether treated as a noun or a verb, improvisation is guided activity whose guidance comes from elapsed patterns discovered retrospectively.

Miner, Bassoff, and Moorman (2001: 314) have defined improvisation as "...the deliberate and substantive fusion of the design and execution of a novel production." In other words, theorists place an emphasis on time, and all stress the simultaneous or near-simultaneous conception and implementation of action, as in the playing of a note in jazz or the introduction of a product design element or process in manufacturing. Miner, Bassoff, and Moorman (2001) have further identified several distinct improvisational products. These include "artifactual improvisations," where the outcome is a tool or object; "behavioral improvisations," where the outcome is a new process or set of actions; and "interpretive improvisations, where the product is a new way of understanding needs, obligations, or conditions. They note that while much writing about improvisation in the management literature takes a generally positive stance, outcomes are not always favorable, and moreover organizations do not always learn from their improvisations or gain methods or insights with any longevity.

Adopting a different approach, we (Wachtendorf, 2004; Wachtendorf and Kendra, 2005; Kendra and Wachtendorf, 2006) have postulated a 3-element typology of improvisational types, based on the emergence of improvisational activity with respect to an existing plan, model for action, or standard procedures. In *reproductive improvisation*, improvisers

recreate an existing capacity; in *adaptive improvisation*, they amend an existing capacity to match changing demands, producing a new system, and in *creative improvisation* they create an entirely new capacity in the absence of an existing model. All of these forms occur under tight time constraints and with pressing demands for action.

Public officials, especially those accustomed to highly controlled and regimented organizational structures, tend to be discomfited by the prospect of improvisation in their environs, since improvisation suggests not only novel, untested, and perhaps unexpected actions, but also actions that may be taken unbeknownst to other participants in an emergency response. The result of such autonomous activity is likely to be confusion, waste, and poor delivery of emergency management services. Indeed, for some officials, and even for some scholars, the image of improvisation is of independent, disconnected, and chaotic activity—the kind of activity that emergency plans, and management structures such as the Incident Command System, were developed to prevent. Such images are, at best, a caricature of improvisation and at worst reinforce the perception that improvising is an also-ran to detailed planning. Improvisation, if it is truly a set of individualistic acts, can go badly and yield the malfunctional outcome feared by emergency managers and other officials. However, group improvisations, the emergent products of collective problem-solving activity, can be highly effective responses to unusual situations and novel demands.

Other works explore in detail the numerous examples of improvisation during the World Trade Center response (Kendra & Wachtendorf, 2003a; Wachtendorf, 2004; Wachtendorf and Kendra, 2005; Kendra and Wachtendorf, 2006). We review some of them here to illustrate the important role improvisation plays in disaster management. On the morning of September 11, 2001, Office of Emergency Management (OEM) officials were at their emergency operations center (EOC) preparing for a bio-terrorism exercise. The EOC and OEM offices were located at 7 World Trade Center, adjacent the Twin Towers. This state-of-the-art facility was constructed in the late 1990s and was equipped with sophisticated monitoring equipment and designed in such a way, in work pods comprised of specific organizational representatives, to maximize coordination between the numerous agencies that would need to respond to various emergency support functions. 7 World Trade Center was damaged by debris from the Twin Towers and collapsed later that afternoon.

With no back-up facility in place, OEM staff and city agency representatives needed to quickly improvise a new site of central coordination. Eventually that day, a temporary site was established in the police academy library, and within several days the operations were shifted to a large shipping pier along the Hudson River (the intended site for the next day's bio-terrorism drill). The initial goal was clear: improvise in such a way as to closely reproduce the 7 World Trade Center EOC. The original EOC would have proven a formidable site from which to launch a response of this kind. In other words, improvisation manifested itself so as to employ substitutes in an effort to replicate the original facility.

In a like manner, the overwhelming involvement of local agencies and volunteers as well as the widespread convergence of people and organizations from across the country to help with the response generated a demand for adaptive improvisations with respect to credentialing. The standard operating procedure of relying on agency badges for entry into areas associated with the response efforts was inadequate to limit the number of personnel and volunteers from entering secured areas. Indeed, the emerging response network included key participants with much needed expertise, but who were either unaffiliated with a recognized agency, associated with an agency from outside the traditional response network, or affiliated with an organization from outside the greater New York metropolitan area. At the same time, allowing every city worker with an agency badge to have site access would have been equally unmanageable. A new credentialing system consequently had to be adapted from the original protocol. Then, as response locations changed, as badges needed to be accounted for, as access needed to be tightened – for example, for safety reasons at Ground Zero-- and as more sophisticated credentialing equipment became available, adaptations were made to the badges themselves. Even as a new credentialing system was improvised, those in charge of site security found that additional adaptations were needed to account for new circumstances or unintended consequences of the new badges themselves.

The waterborne evacuation of Lower Manhattan is an exemplar of creative improvisation. During that event, several hundred thousand people were evacuated in a spontaneous fleet of assorted vessels: towboats, dinner cruise boats, tour boats, yachts, and other craft converged on Manhattan and shuttled evacuees to Staten Island, Brooklyn, or various points in New Jersey. Upon disembarking people, the boats carried supplies and rescue workers into the city, an operation which for some vessels lasted several days. There was no pre-planning for this kind of event, although the Coast Guard personnel who helped to coordinate this event drew on elements of search and rescue and crisis management plans that presupposed a much smaller incident. Instead, participants in the evacuation and supply lift operation responded to cues within their environment based on their own repertoire of knowledge and experience to determine that a response was necessary. Such cues included sightings of individuals gathering at the waterfront as well as sightings of and radio transmissions from other vessels. Their repertoire included an understanding of the harbor, knowledge of the commuter population that comprised the daily population of Lower Manhattan, training in spills or search and rescue operations, and an occupational ethos of rescue, albeit one typically associated with rescue-at-sea operations.

We should be clear when we discuss improvisation that we're not talking about everyone "doing his own thing." Certainly there is room for individual initiative and innovation. For a particular set of necessary tasks, tools and methods can be assembled from available materials. Such improvisations, enacted at a local level and at a restricted scale, are not likely to disrupt action in a larger response milieu. But improvisations that are likely to ramify throughout organizational space present a different set of challenges. Here decisions and actions can influence the conduct of other actors, perhaps by drawing away resources of personnel or equipment, or by shifting the conditions of the operational environment that someone else depends on.

It is this outcome—an anarchical collapse of organization—that emergency planners fear most in improvisational settings and that operational protocols such as the Incident Command System were developed to avoid. Yet the Incident Command System has its faults. Buck, Trainor, and Aguirre (2006) noted that ICS functions best in situations that are familiar, where participants have worked together before, and that are of a limited scope. It is less effective, according to their findings, in situations that are new, surprising, or massive—in other words, where its promised benefits are most urgent! This suggests that there is something about making ICS work that is not inherent in its design, but rather that there is something that organizations bring into the mix (otherwise it would always work). Bigley and Roberts (2001) found that members of incident command systems indeed did improvise some aspects of it to help them in particular situations, a finding that again suggests that responders have an “extra-ICS” set of capacities that they draw on in an emergency but which ICS allows them to focus and which, also, *supports* ICS, too.

Our work on improvisation supports this broad proposition—in particular, that the individual and organizational properties that make ICS “work” can allow organizations to cooperate effectively outside the ICS regime and might in fact be the starting point for a larger organizational development. Stated differently, the same qualities that make ICS work can allow other kinds of organization to be effective, as well. For example, in the waterborne evacuation, the participants were familiar with each other. They had worked together before, and they were familiar with the resources and with the maritime operating environment. In this event, a loose-fitting organization evolved with a very flat hierarchy that emerged around coordination and traffic control of vessels and the establishment of three main evacuee marshalling points ashore in Manhattan. A bus company joined the operation on the New Jersey side, transporting the disembarked evacuees to mass transit points. Participants in this operation became participants by identifying and filling needs; organizing around tasks and geography; and providing information and allowing the persistence of organizational autonomy.

Moreover, this operation occurred almost completely disconnected from the response operations at the WTC site. It was a separate entity, with no intersection with the shoreside emergency management function regarding sharing or drawing away resources. In fact, these vessels brought *in* personnel, equipment, and fuel, functioning in a modular organizational structure that carried out collectively-defined tasks in support of overall response goals.

But, though this event was improvised it was not anarchical. Some participants referred to “chaos,” and in reviewing certain photographs and video of the event it certainly appears, at least superficially, to be extremely hectic. But there is other information to bear in mind when considering whether “anarchy” was involved, or something else. There were no significant injuries or vessel mishaps of any substance during the evacuation. Boat operators negotiated with each other for access to docking space, or simply stood off and

waited their turn. Several participants reported that the usual competitive maneuvering did not occur between captains.

The utility of community organizations, and community-based participation, should not be underestimated even in terrorist-attack scenarios. While we lately hear considerable discussion of the need for “command and control,” the desired outcome of this—coordinated use of resources—is achievable through many types of organizational structures, some of which are likely to be far more appropriate in civil contexts where command-and-control has little resonance. Instead, preparedness activities should involve considerable outreach into communities.

We need to be identifying resources in advance, and we need to allow our collective imaginations to roam over the range of skills and assets that are out there. If there are obstacles to a particular application of a certain resource, those should be identified and examined to see if they might be reasonably set aside in a compelling emergency. Our work in the World Trade Center disaster uncovered numerous such “workarounds” of greater or lesser scope—for example, boats carried passengers in excess of their certified capacities, or carried passengers with no certificate to do so.

Where do such resources exist? They exist everywhere in our communities. To take the WTC attack as an example, we have said elsewhere that New York City contained every skill needed to handle the disaster (Kendra and Wachtendorf, 2003a). But it is important to bear in mind that those skills and capacities were not all in the formal, pre-established emergency response organizations. Some of those skills were in other organizations in the city government. For instance, as has been documented elsewhere (Langewiesche, 2002; Wachtendorf, 2004; Wachtendorf and Kendra, 2005) the city’s Department of Design and Construction had had no previous disaster management experience, yet emerged as the lead agency for the long “unbuilding” of the Trade Center. The Department of Health had no statutory authority for the environmental health aspects of the response, yet they took on that role. The private sector provided personnel, materials, and expertise, as in the construction trades. Restaurants supplied food (Kendra and Wachtendorf, 2003b), while community based organizations from the service, advocacy, and faith communities provided support and comfort. The speed at which OEM was able to reestablish the EOC after it was destroyed was in no small part due to the tremendous resources at its fingertips and its knowledge of those resources. Expanding the lease on the shipping pier from a day-long exercise to occupation of several months and transforming the site into the necessary facility required a flexibility to conceive of that space in non-traditional ways. Without having an open mind to envision resources in new ways, or without having an organizational culture to allow for that envisioning, improvisation is improbable. Without having an understanding of the resources available to begin with, improvisation becomes impossible.

As with any art, the skill of improvisation cannot be taught by assigning a script or working through a check-list of steps. Its principles, however, can be taught and the knack of improvisation can be developed through practice and exercise. To the extent that acts of

improvisation depend on attributes of creativity, improvisation can be enhanced by removing organizational impediments to creative thinking (Kendra and Wachtendorf, 2003c) and by creating an organizational culture that values improvisation. Again, we don't argue that plans or planning should be discarded, only that plans should be seen as guides, and planning should be seen as rehearsing for later improvising. Simply inviting representatives of organizations and agencies to meet regularly can be a useful activity, to build acquaintances, to share information, and to develop norms of mutual interaction. Drabek (2001: 11) argued that "the capacity to improvise is greatest when the pre-disaster response network has been nurtured and integrated." The extent to which plans do account for circumstances that arise in a disaster in fact can facilitate the process of improvisation. That is, when certain elements of the response are not disrupted or are encompassed in prior planning, responders can direct their attention to the unanticipated elements of the disaster and improvise with a more concentrated focus. It is not a matter of abandoning planning for improvisation, nor is it a matter of planning with the goal of eliminating the need for improvisation. Rather, planning and improvisation are important aspects of any effective disaster response and are best considered as complementary.

Thus far we have been concerned with a practical or instrumental outcome of tolerance for, even celebration of, improvisation. But we can argue for a more theoretical significance for an institutionalized appreciation for improvisation: that it provides leverage for putting management—contemporary, updated, current conceptions of management—into emergency management, at least with regard to the response phase, the phase that is least amenable to standard management practices familiar in routinely-functioning organizations and situations. As noted earlier, Weick (1998) asserted that all management is improvisation to some extent. Thus, as a common reference point, improvisation can provide a connection between emergency management and "regular" management. Such a connection would be important in the further development and grounding of the emergency management field.

Weick (1996), in the 40th anniversary issue of *Administrative Science Quarterly*, reflected on the challenges facing organizational scientists—challenges that included encroachments by the competing discipline of economics, and by a shift in the legitimacy of knowledge production away from universities and toward the business sector. Weick developed his argument by allegory, highlighting the failure of firefighters at Mann Gulch and South Canyon to "drop their tools." Burdened by their heavy equipment, they couldn't run fast enough and perished in advancing wildfires. For Weick, those tools emerged as central to the firefighters' identities as firefighters, and the inability to discard them was the physical manifestation of an individual and organizational incapacity to make new sense of a shifting situation. The tools were a kind of existential compass that oriented them to a certain view of themselves and their relationship to that place, though its features shifted around them. Weick thought that organization researchers now faced a similar crisis of situational awareness, which demanded an ability and a willingness to drop old tools of research methods and paradigmatic understanding.

An inverse situation is possible—the need for a discipline to *pick up* its tools (see Beunza and Stark, 2003). Emergency managers often talk about the “hands on” nature of their work, especially to distinguish it from research and academia. But the phrase is at best metaphorical, referring to engagement with real events, because emergency managers do not really use “tools” in the sense conferred by the phrase. First responders, rescue workers, and heavy equipment operators use tools. However, the principal tools of emergency managers are intellectual and conceptual, involving relationships of people, things, and places. (Quarantelli, 1997; McEntire, 2005; Pine, 2006).

While it is easy to see the intellectual heritage of the emergency management field, it is less easy to find a unifying theme for its practice, since emergency management encompasses an enormous array of activities taking place at many temporal scales and at multiple organizational levels. Indeed, much of what emergency managers do does not involve emergencies, but rather involves reducing the likelihood of emergency (mitigation) or preparing to respond to one (preparedness) (McEntire, 2005). These activities involve management as generally understood. In a recent essay for example, Pine (2006) discusses how management theory applies to emergency management, identifying a number of management principles that relate to recognized emergency management activities. These principles include long-term and strategic management approaches, sustainability, diversity, systems theory, and flexible thinking and flexible structures. He stresses the need for “improving the management in emergency management.” Our assessment is generally congruent with Pine’s comments on the intersection of management theory with emergency management, and that the emergency management discipline shares certain analogous historical trajectories, as in both fields’ borrowing of themes and practices from other disciplines. However, although the applicability of management theory to emergency management can be seen, application of management principles is more by the accident of situational necessity than by conscious effort to incorporate management theories. As a consequence much insight is lost, and there is a tendency to see emergency management as a separate kind of management, where ordinary rules don’t apply. But people are people whether the milieu is corporate or crisis, and there is no good reason to suppose that the social relationships of organizations in emergency are going to be different from the relationships that function in other situations. In fact, the guiding idea at the founding of the disasters field was the opposite: that disasters were an opportunity to examine social relationships in a compressed time interval (Fritz, 1961: 654), an idea that depended on the congruence of these relationships in both crisis and normal times. It might be more accurate to argue for the need for “putting the management into emergency management” because although we can see the relevance of management science and the appearance of social phenomena that occur in other settings explicit management applications are sketchy at best in emergency scenarios.

There is one exception to this observation about the sketchiness of management theory in emergency management, and that is the near-universal approval of the Incident Command System, which was developed according to the management principles that were ascendant in the early to mid-1970s (Irwin, 1989). These principles have, however, been

superseded in many applications, especially those focusing on rapidly-changing environments (Daft, 2004). Thus management theory's most significant and enduring impact is in a largely obsolete organizational scheme (Waugh, 2006).

If we are going to put the management into emergency management, what should it look like? While it is beyond the scope of this paper to offer a complete mapping of management principles to emergency settings (a task begun by Pine (2006)), we argue that creativity and improvisation are good candidates for comprising an orienting theme or set of concepts for emergency management in the response phase. If we take the view that disasters are social events, as Dombrowsky (1995) and others have argued, involving disrupted social structure, as in Fritz's definition (1961: 655), we can see that emergency managers manage social relationships to correct those disruptions. They do this by rapidly recombining resources, skills, and experience, capitalizing on agreements, expectations, and norms.

Either for improving the management in the field, or for putting it in, an updated approach is needed. Pine (2006) suggests the need for "more dynamic organizational structures" that are responsive to changing needs, especially given the open system character of emergency management operations. Emergencies are the most open of open systems; much of the management, when an emergency is involved, is of fleeting and transient things. Individual and organizational participants come and go, so that emergency managers are really managing a shifting pastiche of relationships and arrangements. They are managing, or trying to manage, interactions of social and physical systems, not in the comparatively stable situation of a factory or a firm, but in the changing circumstances of environmental turbulence.

Harrald (2006) argues that characteristics of both "agility and discipline" are needed so that organizations can maintain their coherence while at the same time respond to surprising conditions. Plans and structures that allow for easy modification facilitate both the shared operational concepts and mutable procedures needed in crisis, but practice together, as in a jazz band or theater ensemble, is need to fine-tune the artistry of response. We would argue for a scientific basis of emergency management that emphasizes management, not emergency, but it should be the management of dynamism, of ambiguity, and of change. Only improvisational skills can provide the necessary capacity for this spirited approach to crisis.

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