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Large Emergency-Response Exercises: Qualitative Characteristics - A Survey

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Abstract

Exercises, drills, or simulations are widely used, by governments, agencies and commercial organizations, to simulate serious incidents and train staff how to respond to them. International cooperation has led to increasingly large-scale exercises, often involving hundreds or even thousands of participants in many locations. The difference between 'large' and 'small' exercises is more than one of size: (a) Large exercises are more 'experiential' and more likely to undermine any model of reality that single organizations may create; (b) they create a 'play space' in which organizations and individuals act out their own needs and identifications, and a ritual with strong social implications; (c) group-analytic psychotherapy suggests that the emotions aroused in a large group may be stronger and more difficult to control. Feelings are an unacknowledged major factor in the success or failure of exercises; (d) successful large exercises help improve the nature of trust between individuals and the organizations they represent, changing it from a situational trust to a personal trust; (e) it is more difficult to learn from large exercises or to apply the lessons identified; (f) however, large exercises can help develop organizations and individuals. Exercises (and simulation in general) need to be approached from a broader multidisciplinary direction if their full potential is to be realized.

Keywords

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Many organizations now hold exercises, in order to test how they would respond to particular sets of circumstances and to train their staff. These exercises may be called 'drills' or 'simulations': There is no standard terminology. Examples of organizations and the circumstances they test include the following:

Organization	Circumstances Exercised
Military	Hostilities, internal security, counterterrorism, disaster relief
Police	Major accidents, counterterrorism, breakdown of public order
Fire services	Major fires, chemical or industrial accidents
Health agencies	Major incidents causing mass injuries, epidemics, release of biological warfare agents
Industry/Commerce	Major industrial accidents, loss of key business activities ('business continuity'), hostile takeovers. major crime (e.g., kidnapping), bomb threats

This list is by no means exhaustive, and often, several organizations will be involved in one scenario: For instance, an exercise based around a serious explosion at a chemical plant may involve most or all of the above. As a result, very many exercises are held each year in the United Kingdom, the United States, and elsewhere (Upton, Forthcoming 2009).

For reasons of cost and time, most exercises are small. Many are what is often called *tabletop* exercises, in which participants sit in the same room and 'talk through' a scenario, perhaps with visual devices to prompt the imagination, such as slides or maps. Terminology varies (Upton, 2007). Sometimes, they are larger, with participants actually role-playing some organizations. These intermediate exercises usually take place mostly over the telephone between emergency response teams and role-players. Sometimes, they also involve physical simulation—for example, fire appliances may deploy to the scene of the imaginary incident and spray foam or rescue dummy casualties.

Some exercises, however, are 'large' exercises, and it is with those that this article is concerned. There is no agreed definition of a 'large' exercise. Most of us can distinguish a tree from a bush, but in between the two is a grey area, where certain plants might be either. This article will attempt to isolate some of the factors that make an exercise 'large' and, we will argue, give it a special dynamic and an additional set of meanings that 'small' exercises do not have. The two are both quantitatively and qualitatively different, although in quantitative terms they are different ends of the same spectrum. Not all factors are present in every 'large' exercise, but in our view, the more that are present, the more the exercise displays the qualitative differences we seek to describe.

Modern exercises may be said to have begun with the Kriegsspiel, a system for training officers in the Prussian army, invented in the early 19th century (Leeson, n.d.). This was a system for abstracting military maneuvers, so that they could be

simulated on a board or in a sandbox using models of soldiers, cannons, and so on and bound by rules intended to make the process realistic: for instance, the speed of movement of different units, the effects of firing various weapons, or the losses in hand-to-hand combat. In actual maneuvers with real troops, it would be possible to test the speed of movement, but the only way to factor in firepower or casualties was to actually fight a battle. Kriegsspiel therefore allowed commanders to consider strategic issues in more depth without the cost or expense of physical maneuvers or the undesirable consequences of real war. For a long time, exercises were mostly used by military or civil defense authorities.

The demand for large-scale exercises in civilian environments appears to have grown from around the mid-20th century, in parallel with our expectations of social organization. As one example, major floods in the United Kingdom in January 1953 killed 307 people. Although the floods took 11 hours to move from Aberdeen to the Thames Estuary (BBC 2003a) and the movement and timing could be easily predicted, little or no warning was given to communities in the path of the floods. As a result, 58 people died in Canvey Island at the end of that 11-hour period (BBC, 2003b). The lack of warning was partly because telephone lines were blown down by the associated storm but mostly because there was no single organization charged with monitoring such floods or raising the alarm. (A similar situation occurred during the December 2004 Tsunami in Southeast Asia.)

Our expectations of 'the authorities' have now changed radically, and extensive flood monitoring and flood warning systems now exist in many countries, although with varying degrees of comprehensiveness. These, however, bring with them the need for exercises in order to test the systems and to train those who have to use them. The first U.K. national-scale flooding exercise, 'Triton,' was not in fact held until 2004 (Younge, Pettifer, & Burton, 2005). According to the official report (DEFRA, 2005), over 60 organizations were involved, based at 35 locations. The organizations included the Environment Agency, police forces, fire services, ambulance services, central government departments (such as DEFRA and the Cabinet Office), local authorities, health authorities, the military, HM Coastguard, utility companies (power, water, gas, communications), the Government News Network, English Nature, and internal drainage boards. The report says, "The exercise was planned over one year with a project structure consisting of a National Project Board, a National Partnership Team, a National Project Team, National Scenario Planning Team and local Scenario Planning Sub-Groups" (DEFRA, 2005, p. 64).

Modern communications methods have made it possible for multinational exercises to take place in which participants are linked by teleconference and can refer to the same documents. For example, the U.S. government and others, including the U.K., have taken part in the TOPOFF series of counterterrorism exercises, for example TOPOFF 4 in 2007, which involved "more than 15,000 participants representing federal, state, territorial, and local entities, as well as the governments of Australia, Canada, and the United Kingdom." (Department of Homeland Security, nd.)

We suggest that it is possible to isolate several factors that distinguish the 'large' exercise from the 'small' exercise. These terms are of course arbitrary, and most exercises lie on a continuum between the two. However, the factors are the following:

1. number of participants
2. multilocation; difficulties of interpretation
3. more actual simulation or 'live play'
4. multiowner, multiobjective
5. more 'experiential,' less controllable
6. fewer assumptions made

Number of Participants

Small tabletop exercises may involve fewer than 12 participants. By contrast, a recent U.S. government drill involved 'thousands' of federal employees over 3 days (Sheridan, 2008). Military exercises can also be very large: For example, 5,000 U.S. service personnel and 120 aircraft took part in exercise Northern Edge 08 in Alaska from May 5 to 16, 2008 (Global Security, 2008). The European Union pandemic flu exercise, 'Common Ground,' held from November 23 to 24, 2005, involved nearly 1,000 representatives from 25 countries (Health Protection Agency, 2006).

As well as involving more people, the larger exercises typically last longer. All the examples cited here lasted for several days. Small exercises typically last for no more than 2 or 3 hours.

Locations and Interpretation

Large exercises almost always involve participants in several locations. 'Common Ground' involved players in 25 countries and, in some cases, in different locations within each country. 'TOPOFF 4' clearly involved very many sites in the United States as well as internationally. This has two major effects:

1. Because players cannot see each other or interact directly, they do so using communications media such as telephones or teleconferences. This has the effect of splitting them into separate groups, and a 'them and us' mentality can more easily develop than when all players are in the same room or a group of rooms in the same building.
2. It is much more difficult for any one person to form an overall view of how the exercise went. Your assessment will always be biased by your location and what you actually observed.

Additionally, although modern communications systems are good, physical failures occur from time to time. This can make it still more difficult to understand the overall picture of the exercise. (One of the authors once observed an exercise in which two

sets of participants, in the same room, took part in two separate teleconferences at the same time. Unfortunately, the microphones were sensitive enough to pick each other up and led to total confusion between players in the United States, Europe, and Africa as the conversations merged into one.)

Physical Simulation

Large exercises are more likely than small ones to involve some form of physical simulation of the scenario that underpins them, whereas in 'small' exercises, external scenario events are usually only reported at secondhand by a role-player. The authors have organized exercises in which

- fire appliances attended a notional fire on a petroleum loading jetty, and fire monitors sprayed water and foam (Channel Online, 2006)
- counterterrorist forces (using blank ammunition) attacked role-players acting as terrorists
- dye was spread on water to represent an oil spill
- aircraft sprayed water on the sea to represent the spraying of oil dispersant
- 'activists' chained themselves to railings of a refinery

These actions introduce new dimensions into the exercise. For many players, they introduce new experiences: Few office workers have seen such things before. If nothing else, it takes managers out of an office environment into the field.

These simulations introduce an element of unpredictability and danger into the exercise. For example, in July 2008, French troops giving a demonstration of counter-terrorist techniques inadvertently shot and injured 17 civilian spectators, some seriously (BBC, 2008). Thankfully, such appalling errors do not happen often, but physical simulation exercises always require a risk assessment. Players and observers may find themselves working in hazardous areas and subject to unfamiliar safety rules. Players representing casualties need to have a method of indicating when they are genuinely in distress as opposed to simulating it.

Multiowner, Multiobjective

Typically, exercises are large because many organizations are taking part. Each of these organizations has its own set of objectives for participation and in many cases its own 'agenda.' Sometimes these agendas are almost competitive: Organizations may wish to stake or reinforce a claim to take part in activities or to be consulted. (One of the authors organized an exercise in which an 'oil spill' had to be moved several miles in order to allow one participant to exercise plans to boom off a river.) Because agendas are different, there is sometimes a sense of unreality for some groups of players, who may be 'going through the motions' in order to accommodate others. It is often clear that some organizations are playing a central role, while others are more peripheral.

More 'Experiential,' Less Controllable

The overall result of all these differences is that the 'large' exercise is typically less predictable and less controllable than the 'small' one. The role of the exercise organizer is to keep track of the exercise once it starts and to ensure that it meets its objectives. But no organisational staff can be everywhere at once. This can sometimes result in muddle and confusion: For instance, the U.S. military exercise 'Millenium Challenge 2002' had to be restarted after one participant exploited the rules in a way that the exercise planners had not anticipated (Borger, 2002). There are several other sad stories of exercises that had to be aborted after the media or the public saw or heard of simulated disasters and assumed that they were real.

When telephone or Internet communication is involved, real breakdowns can occur. When actual personnel movements take place, real holdups happen. These can occur at very inconvenient times, sometimes significantly reducing the value of the exercise. (It may be thought 'realistic' to simulate telephone failures in a small exercise, but usually, an exercise is seen as a training opportunity for the participants, and it is thought to be a waste of time to bring them together and then deny them the means they need to work together.) As a result the 'large' exercise often leads to unscripted learning on everyone's part: There are more surprises and there is less control and more uncertainty.

Exercises and Assumptions

The concept of 'modeling' is worth further attention. It is widely used in the social sciences and elsewhere and has many different shades of meaning. However, we use it to mean the way in which an exercise attempts to represent 'reality,' so that the linkages used and the assumptions made in the simulation can be assumed to be valid if the real event occurs. That is, if during the exercise you contact 'the police' about a given issue, you must be able to assume that the reaction you get from them during the exercise is representative of the reaction you would get from the police during a real incident.

In all exercises, a number of assumptions are made. For example, if the police do not actually take part, they may be role-played, and the role-players may rely on a belief about how the police would actually act. (This belief should be based on research into police procedures, but this research may not be comprehensive.)

Clearly, the 'smaller' the exercise, the fewer the actors who actually take part, and the more likely it is at some stage that assumptions will be made. In tabletop exercises, for example, the players are likely to be given only very brief statements, which they have to accept as 'fact' (e.g., "The police have set up a Silver Control and are coordinating an evacuation of the area"). The background issues involved in real life are many, and some of them are as follows:

- How long did it take police to arrive and set up Silver Control?
- What advice did they take and from whom?

- How will they notify the people to be evacuated? Do they have enough manpower?
- Will police officers be putting themselves at risk?

There are also a great many unspoken assumptions, all the more dangerous because it is often never realized that an assumption has been made. (One of the authors once ran a large exercise for a company based in the City of London financial district. This took place at night. The main lesson from the exercise was that at 4.00 a.m., no one could find the two junior people who held keys to the office. This was an invaluable lesson, which would not have been detected in a tabletop exercise that began with an assumption that "the response team are now meeting." It was, however, an unnecessarily expensive and time-consuming way to learn that lesson and something that we tend to check first nowadays).

In exercise terms, the more assumptions that are made and left to go untested, the less likely it is that the exercise will challenge or surprise the players, whereas in a 'large' exercise with many players taking part 'for real,' it is more likely that differences will emerge. An exercise that leaves senior management standing outside their offices at 4.00 a.m. is likely to generate considerable levels of stress for all concerned.

In other words, in the 'large' exercise, the players are more exposed to external 'reality.' Without wishing to enter into metaphysical issues, it is clear that each exercise creates a model of the 'real' world, but the larger the exercise, the more likely it is that 'reality' will break through and force a real-time revision of this model. This may be physical reality (difficulties of access, time taken to travel, etc.) or it may be unexpected attitudes and responses from other players ("We did not realize the police would do it that way"). Any single organization or exercise organizer running a 'large' exercise is less able to control the total exercise environment and to impose one single model of 'reality' on the players.

A Definition of Success

This article will use the term *a successful exercise* and we need to explain what we mean by it. An exercise is successful if the participants learn from it. The measure of its success is the extent of their learning. We start from the assumption that exercises in which everything goes very smoothly are often unsuccessful exercises: Life does not usually go smoothly, and any simulation that does not throw up issues has probably failed to spot them. As the participants and their plans improve, the issues typically become less fundamental and more detailed, but they never entirely stop coming. Occasionally, exercises are deliberately written to be 'easy' in order to minimize embarrassment (Upton, 2007, p. 81).

In our experience, there is a first type of failure, which is when the exercise does not address the right issues, is inadequately researched, badly organized, or unconvincing. Lessons identified in these cases are more about the nature of the exercise (i.e., its failure) than about the process it is modeling.

A second type of failure is when the participants do not allow the exercise to succeed. For 'political' or personal reasons, they do not enter into the spirit of the event, or they allow external issues to dominate their approach. This often happens when organizations are rigid or suspicious and resist learning opportunities. Individuals do not feel secure, and their response is usually to try to blur the boundaries between exercise and reality ("This would not happen in real life" or "This is just an exercise so I'm not going to do all that," or even "A real incident came up at the last minute, so we could not attend"). From the organizer's viewpoint, it is important to identify exercise participants who are not happy about participation and prepare the ground with them in advance.

The Exercise as a 'Learning Space': Some Insights From Modern Art Theory

One source of insight is the study of games, particularly through artistic theory. It has been argued that the creation of games or 'situations' puts the participants into different states of mind and alters their perceptions of reality. For example, the Situationist group, led by Guy Debord, saw much of its artistic activity as the creation of 'situations':

> Our action on behavior, linked with other desirable aspects of a revolution in mores, can be briefly defined as the invention of games of an essentially new type. The most general goal must be to expand the non-mediocre part of life, to reduce the empty moments of life as much as possible. One could thus speak of our enterprise as a project of quantitatively increasing human life, an enterprise more serious than the biological methods currently being investigated, and one that automatically implies a qualitative increase whose developments are unpredictable. (Debord, 1957)

Their journal, *Situationist International*, defined a situation as "constructed situation: A moment of life, concretely and deliberately constructed by the collective organization of unitary environment and the free play of events." ("Definitions," 1958), and the journal explains the construction of a 'situation' in terms which sound very like an exercise:

> A constructed situation must be collectively prepared and developed. It would seem, however, that, at least during the initial period of rough experiments, a situation requires one individual to play a sort of "director" role. If we imagine a particular situation project in which, for example, a research team has arranged an emotionally moving gathering of a few people for an evening, we would no doubt have to distinguish: a director or producer responsible for coordinating the basic elements necessary for the construction of the decor and for working out certain interventions in the events (alternatively, several people could work

out their own interventions while being more or less unaware of each other's plans); the direct agents living the situation, who have taken part in creating the collective project and worked on the practical composition of the ambiance; and finally, a few passive spectators who have not participated in the constructive work, who should be forced into action. ("Preliminary Problems in Constructing a Situation," 1958)

The article goes on to argue that the 'situation' temporarily creates a new form of experience in which participants acquire new perspectives on their lives:

A situation is also an integrated ensemble of behavior in time. . . . The really experimental direction of situationist activity consists in setting up, on the basis of more or less clearly recognized desires, a temporary field of activity favorable to these desires. This alone can lead to the further clarification of these simple basic desires, and to the confused emergence of new desires whose material roots will be precisely the new reality engendered by situationist constructions. . . . We must thus envisage a sort of situationist-oriented psycho-analysis in which, in contrast to the goals pursued by the various currents stemming from Freudianism, each of the participants in this adventure would discover desires for specific ambiances in order to fulfill them. Each person must seek what he loves, what attracts him. ("Preliminary Problems in Constructing a Situation," 1958)

Artistic theory tends to see the 'situation' as a means of breaking participants out of the rut from which they may see society, in order that they will change it. The Situationists approached this from a 'political' standpoint, and the changes they envisaged were broadly 'left-wing' economic and social policies. However, an emergency response exercise involves challenging participants with an unusual 'emergency' situation and encouraging them to find a response. Many 'lessons learned' in exercises may have found their way into law or at least into the response procedures of organizations. Debord might not have approved of the changes made, say improved efficiency of police procedures, but he ought to have felt at home with the methods used.

Artists are also fascinated by the social implications of large exercises and the implications for social control, as one part of the population practices how to handle another. The Dutch pavilion at the 2007 Venice Biennale art exhibition featured a video installation by Aernout Mik based on "a mixture of staged scenarios and documentary footage depicting the police, teams of first responders, refugees and victims in crisis situations" (Mik, 2007).

However, we are concerned with the effects on the exercise process itself. The idea of the 'gamespace' as a psychologically different place is particularly relevant to 'large' exercises, particularly ones in which practical simulations occur and the normal rules of reality are temporarily suspended. This is partly because many exercise scenarios deal with grim subject matter: An epidemic has taken place, a refinery has

caught fire, and so on. In the exercise, the players know that this is not really the case. The participants are 'players' in the sense that they 'play' at solving the incident. Although participation is often a serious and stressful matter, a sense of play remains present in many exercises. Serious contemplation of the underlying scenarios would often add considerable stress, and participants naturally tend to defuse this with humor. At the same time, the exercise is addressing broad societal issues: What would happen if this refinery were to explode? How can we balance the need to produce petrol with the need for safety? Or the need for housing with the desirability of keeping land around the refinery edge empty?

We suggest that participation in 'large' exercises, and particularly simulations, reinforces and extends the way in which participating groups see themselves. By playing at their 'real' roles—for instance, fire service officers pretending to rescue victims or police officers controlling the public—organizations dramatize their own social roles and play through their doubts and conflicts, acting them out in front of their peers, and (in Debord's phrase) they "seek what they love and what attracts them."

On a group level, they are also acting out the resolution of major issues. For example, we know that refineries do sometimes catch fire, and it is reassuring to believe that when this happens all concerned will respond promptly and effectively. There are several examples of exercises being explicitly used to reassure the public, where the exercise becomes almost a public drama designed to act out the resolution of this threat in order to engage with societal fears and then resolve them (Upton, 2007). Whether or not they reassure the public, successful exercises certainly reassure the participants, and this role is recognized in the way that they are accepted by safety regulators as proof that precautionary measures are in place.

The Exercise as Group Learning Process: Insights From Group-Analytic Psychotherapy

There are also interesting parallels from the sphere of group-analytic psychotherapy, a clinical discipline that can trace its roots, in part, to therapeutic experiments conducted (separately) by Wilfred Bion and Sigmund Foulkes at the Northfield Military Hospital in Birmingham, England, during the World War II, with the objective of "turning the headlong flight of men who had lost all confidence, all sense of belonging, and who wished only to run to a mythical 'home'" (Harrison, 2000, p. 15).

This form of psychotherapy focuses on the group rather than individuals: Foulkes said that it "focuses on the total interactional field, on the matrix in which these unconscious reactions meet. . . . [The] . . . background is always and should consciously be the group as a whole" (Foulkes & Anthony, 1957, p. 29).

Foulkes is considered to be the originator of the group-analytic 'small group' model, a forum generally comprising about eight members, in which, in an atmosphere of permissiveness and acceptance, through free-floating discussion, familial dynamics can play out and interpersonal networks be represented. The conductor has two core tasks: to establish and maintain a therapeutic environment and to join the group in the pursuit and clarification of underlying meaning (Kennard, Roberts, & Winter, 1993).

Group psychotherapists have also worked with 'large' groups. As with emergency response exercises, there is no exact definition of 'large' versus 'small.' Foulkes's pupil Pat de Mare describes the large group as composed of anywhere between 15 and several hundred people, but he also defines groups of 18 to 20 members as 'median groups'—stepping stones in an approach to large groups—and both terms are commonly used (de Mare, 1975). As with exercises, qualitative as well as quantitative differences can clearly be identified between 'large' and 'small.'

For example, de Mare (1975) said, "The small group by its very nature displays only the most fragmentary evidence of social dynamics. To apply small-group or psychoanalytic models to the large group is like trying to play ludo on a chess-board." (p. 146) Often, 'large' groups are considered to be experiential, rather than therapeutic, providing a sociotherapy rather than psychotherapy: It is a learning situation rather than an instinctual one.

Power and Thompson (1992) describe the difference in terms of the modeled environment:

> Once we have left the small group, with its family size and familial dynamics, we enter into a different dimension with different possibilities, providing a different experience and addressing different issues. In group therapy, a concern with context is introduced, but on a limited scale bounded by the family-sized network. (p.1)

(This metaphor is illuminating for emergency response exercises also: 'Small' exercises tend to be 'in-house'—that is, within one organization or corporate 'family'—whereas 'large' exercises usually include many 'outsiders' or different 'families.')

Foulkes and Anthony (1957) described three types of large groups:

1. the problem-centered group (such as staff groups)
2. the experience-centered group ("much practiced in various settings . . . it has become known as a sensitivity group or, following the American example, as a T group"; Foulkes 1975, p. 43)
3. and the therapy-centered group, similar to the problem-centered group but that has been practiced most resolutely in psychiatric hospitals and therapeutic communities

Large groups are gatherings conducted along group-analytic lines and provide a setting in which people can learn to talk with one another. Whereas the leader of a small group is usually called a 'conductor,' large group leaders are usually known as 'conveners.' Conveners help provide a situation in which exploration can take place and in which members can reflect upon the sociocultural context of their lives alongside the developing sociocultural context of the group itself.

Subsequent studies of large groups in operation have drawn several conclusions that are relevant to this article. For example, Schiff and Glassman (1969) described variables relating to group size that included the following:

1. an increased tendency to subgrouping and to stereotyping
2. less opportunity for individuals to speak
3. the dilution of affectional ties
4. increased activity among leaders and increasing silence among less active members
5. greater threat to the individual, anxiety, and feelings of panic

Others have described the emotional, mindless, unstable tendencies of large groups. "The problem for the rudimentary large group is its mindlessness; not how to feel, but how to think" (De Mare, 1972, p. 1).

De Mare (1975) speaks of the effect of large groups on the emotions of those taking part: "The amplifying and totalizing effect of the large group is most striking and emotions sweep like a breeze throughout the entire group, altering the atmosphere, rather as biologically 'the energy of a system acts to organize that system.'" (p. 152)

Power says,

> The frustration, panic and anger that the individual all too often feels when confronted with the crowd, mob or mass outside the family is an important part of the large group dynamic. The larger the group to begin with, the more primitive its response. The larger group setting is frustrating, anti-libidinal and anti-cathartic. Dialogue, tangential and analogic, creates structure and organization. (Power & Thompson, 1992, p. 2)

The large group is experienced as all-powerful and uncaring, rendering the individual powerless and vulnerable. Resistance is often manifested as absenteeism. Panic engendered by the large group situation can lead to flight away from the situation or into family-sized subgroups. It can encourage the installation of an authoritarian leader and a hierarchical system. Such a leader makes the individual feel less alienated and powerless, though in return that individual sacrifices independent thinking. The large group meeting is harsh on 'individual primary narcissism,' which in this context might be defined as self-aggrandizement to the detriment of the team.

Our experience of 'large' exercises has also shown that these tend to be more disturbing for the participants and less controllable by the organizers. Individuals often find them intimidating and tend to subgroup (i.e., stay with their own organization or polarize into competing 'sides') or take flight (i.e., keep their heads down).

Despite the differences of experience in large and small psychotherapeutic groups, therapists believe that significant personal change is possible in either. For the individual group member, there can come an enlarged area of awareness and personal liberation. "The reduction and even the mastery of panic in the large group situation can lead to a raising of the panic threshold in other situations as well, and a greater freedom to operate in new situations" (Power & Thompson, 1992, p. 3).Once again there is a parallel with exercises: If successful, they build confidence in the

participants. By encouraging them to leave the family subgroup and participate more fully, they increase their effectiveness in the modeled situation. Each successful exercise raises the standard; for example, it raises the 'panic threshold' further.

The alternative to flight or dependency is to experience hate: This stage must be gone through before dialogue can begin. The energy of hate is reharnessed to the development of impersonal fellowship, which brings stability and personal gratification at a new level beyond the family. In the process, interpersonal attacks are neutralized while scapegoating and subgrouping can be more easily challenged.

Power and Thompson (1992) say that the first task of the group is to learn to talk and to work through dialogue, which cultivates thinking, toward a transformation into impersonal fellowship. Through such activity, the large group can provide a link between the individual and the forces in the wider cultural environment, which often seem bafflingly beyond human control. (Especially in a large exercise, where the scenario is often grim and painful.) As attitudes and assumptions within the group are discovered and brought within conscious awareness, similarly, attitudes and assumptions outside the group become more accessible to consciousness. Thus, we may begin to bridge the gap that seems to exist between the individual on the one hand and the sociocultural environment on the other.

It is often remarked that one of the major benefits of these exercises is the development of understanding and links between different agencies and groups—bridging the gap, perhaps, between individuals and the wider sociocultural environment. This process takes time, and in its initial stages, the processes of misunderstanding, scapegoating, subgrouping, and hostility can often be experienced by exercise participants.

To facilitate the large group, Schiff and Glassman (1969) recommend that therapist activity be directed toward the following goals:

1. topic selection
2. the creation and maintenance of a safe group climate
3. leaders gatekeeping by influencing the flow and direction of communication
4. modeling—of the group on the therapist; we referred above to the way in which exercises 'model' reality—for example, a role-player representing the police, for example, should behave in the same way as the real police might be expected to behave. In group psychodynamic terms, this word is used to describe the way the group convener demonstrates or embodies the sort of behavior that (s)he expects of group members—for example, rational discussion rather than emotional reactions

These recommendations are very similar to the objectives of anyone organizing a large exercise: They might be rephrased as choose the right scenario, maintain a 'safe space' in which the border between fiction and reality is clear, and 'gatekeep' to ensure that the exercise meets its objectives.

The use of 'large groups' in clinical practice can be quite similar to exercises, particularly when they are 'problem-centered' groups (e.g., staff groups). A recent study in Israel (Nuttman-Shwartz & Shay, 2000) used a 'large group' intervention to help occupational social workers cope with organizational ambiguity. They found that the impediments to contact and communication in the large group frustrated the fulfillment of basic attachment needs and thwarted dialogue. The group generated a sense of chaos and confusion, undermining the integrity of the self and producing heightened aggression and dependency. As they said, the uncertainties of the hypothetical situation brought a rapid response to the ambiguities inherent in the group. The initial reaction was chaotic: emotional, impulsive, fragmented, and full of unthinking acting out. However, as the group progressed, participants explored the relationship between their feelings and behaviors in the group and their feelings and behaviors in their places of work, and came to see where their expectations were unrealistic and how they might assume more personal responsibility and take more initiative.

The group-analytic parallel may seem a strange one. Emergency response exercises do not engage overtly with the emotions or personal growth of the participants. Perhaps because they are mostly organized by and for men, this is a 'stiff upper lip' world, where individuals learn to act as directed by emergency response procedures and their professional training, and are expected to 'manage' or repress any emotions they may feel.

However, anyone who has taken part in such exercises will be aware of the nervousness that some participants feel, the emotions that are aroused, and the sense of achievement that participants feel if the exercise is successful (or the annoyance and grievances if it is not). Those emotions are even greater during a real incident, where individual participants may be at personal risk and the 'scenario' may involve actual harm to real people. It is not clear to us, however, how far any individual emotional growth through exercising might transfer to a real situation.

We suggest that exercise organizers can learn from group psychodynamic insights and should give more consideration to this 'shadow side' of their craft. We certainly believe that these insights help explain why 'large' exercises are quantitatively different from 'small' ones.

Insights From Management Theory 1: Types of Trust

Trust is an essential part of any cooperation between organizations or individuals. Weber (1922) described the bureaucratic organization in which individuals have 'legal' authority because they are members of a particular group (e.g., a police force) and hold an 'office' that entitles and obliges them to apply certain processes in an impersonal fashion. (As Weber said, however, these forms of authority rarely exist in their pure form—for example, the police officer may have considerable discretion in applying the law. He may apply it rigidly or in a flexible fashion based on awareness of the situation. He may see his primary role as helping to resolve an emergency or he may see it as identifying the causes of the emergency and collecting evidence against those responsible.)

According to Ouchi (as cited in Rousseau, Sitkin, Burt, & Camerer, 1998, p. 396), trust is "the result of deep dependence and identity formation." There are, however, different forms of trust, such as deterrence-based trust, calculus-based trust, and relational trust (Rousseau et al., 1998). With respect to deterrence-based trust, one party believes that the other is trustworthy because sanctions are in place that stop the other party breaching an agreement through opportunistic behavior. Calculus-based trust is based on rational choice that is underpinned by interactions of economic exchange, and trust develops because the actions undertaken are beneficial. Relational trust is characterized by repeated interactions over a period of time, and reliability and dependability are evident; emotion is also present in the relationship. This view has been verified by Nooteboom, Berger, and Noorderhaven (1997). Trust-based relationships also increase cooperation among and between people and functions/departments. Interaction between people and functions/departments allows participants to update their information about other parties and reflect upon their previous experience (Lewicki & Bunker, 1996; Williams, 2001).

In small exercises, say within one organization, most players already know (or know of) each other. Hierarchies of position and seniority are already set. In larger exercises, however, individuals from different organizations often meet for the first time. Their initial relationship is one of deterrence-based trust, based only on Weber's 'legal' authority. For instance, I may trust a police officer simply to the extent that he (or she) occupies a role in an organization that can be expected to follow certain processes. I may only partly understand the processes, but I assume that any individual in that office will apply them in the same way.

As the exercise develops, and if it is successful, this trust may turn into relational trust because I come to accept that this particular police officer is reasonable, effective, and so on, and because I come to understand the reasons behind police processes. It is also important that I should feel that the police officer understands my position. (Of course, if the exercise is not successful, my trust is likely to diminish rather than grow, and this can lead to rivalry, refusal to cooperate, and competition. One of the authors took part in an exercise on an airport where the airport fire service instructed the airport security staff to refuse admittance to the local fire service crew who were coming to back them up, as was required by the airport response plan. The reason appears to have been professional rivalry between the officers in charge. Sadly, this incident was politely ignored in the postexercise discussions since everyone knew the personalities concerned, but its effect on the trust between two organizations that should have worked together can readily be imagined. If a real incident occurred, this infantile behavior during training might lead directly to death or serious injury.)

Insights From Management Theory 2: How Do Organizations Learn and Apply Lessons?

Postmortems and debriefings held after the event enable the first responders to offer solutions to recurring problems, and it is also an opportunity for individuals to learn

from each others' experiences and exchange or share ideas, to create a learning opportunity, and to reinforce or build an organizational learning culture. The storing of knowledge and access to stored knowledge is an important factor owing to the effect it can have on how a new challenge is handled (Miner, Bassoff, & Moorman, 2001). Once a decision has been made using stored knowledge, then individuals within the organization can have access to the appropriate resources that are necessary to improve their skill level. Hence knowledge storage and access to knowledge needs to be viewed from the perspective of organizational improvement in the broadest sense. However, owing to the fact that there is a high degree of intraorganizational and interorganizational communication during a complex simulation exercise, trust-based relationships are paramount with respect to debriefing as well as the smooth running of the simulation. If trust breaks down due to misinformation, which causes confusion, or an event not being managed as it should be managed, harmful incriminations can further destabilize existing relationships.

For a learning organization culture to be established, it is essential that senior managers pay attention to how individuals learn and how they develop their skill and knowledge base. Kolb and Kolb (2008), have provided further insights into this by indicating that most people do not "understand their unique way of learning" and that "many have not thought about what learning is and about themselves as learners" (p. 9). Kolb and Kolb (2008) explain that

> those individuals who believe that they can learn and develop have a learning self-identity. The learner faces a difficult challenge with a "mastery response," while the person with a fixed identity is more likely to withdraw or quit. Learners embrace challenge, persist in the face of obstacles, learn from criticism, and are inspired by and learn from the success of others. The fixed identity person avoids challenge, gives up easily, avoids criticism, and feels threatened by the success of others. (p. 10)

By realizing this, simulation designers and those in charge of organizing complex simulation exercises can carefully monitor the performance of the participants and provide specific debriefings that allow those involved in the simulation exercise to reflect and better understand what experiential learning involves. By getting individuals to think in terms of the experiential learning cycle, it should be possible for individuals to think in terms of "when a concrete experience is enriched by reflection, given meaning by thinking, and transformed by action, the new experience created becomes richer, broader, and deeper" (Kolb & Kolb, 2008, p. 13). As a consequence, an individual should be well able to change his or her perception of something and, if necessary, interpret reality in a different way (Kriz, 2003, p. 496).

Sadly, it is clear that organizations do not always learn from exercises. The U.S. Congressional inquiry after the Hurricane Katrina flood in 2005 showed clearly that essential lessons from an earlier flood response exercise had not changed the organizations involved, mainly because organizations chose to believe that the lessons were for

others to implement (Upton, 2007). Brear, in an analysis of organizational learning from the 2005 terrorist bombings in London, has shown that even after a high-profile security incident, much organizational debriefing and learning is not shared:

> The original information had been collected in an unstructured and apparently haphazard fashion in many cases and it was also apparent that there were a number of barriers to collecting data. (Brear, 2006, p. 3)

Sharing lessons is particularly important if the multiagency (or 'large' exercise) is to achieve its wider objectives. However, learning is more difficult from a 'large' exercise or a real large incident. Between the various organizations involved, there is no single manager who can ensure that information is shared and can allocate responsibility for following up issues. Instead, budgetary and 'political' constraints, as well as genuine misunderstandings, limit the willingness of each organization to take on new commitments or to make changes.

It can be said that in order for a group of collaborating organizations to achieve its mutual objectives successfully, it is necessary for staff involved in the joint project group to listen to what other people have to say about a problem and then to establish what information is to be shared. Owing to the fact that the composition of the group changes from time to time, it is essential that the group members create a pattern of behavior that guides future group activity. This is important because there are a number of joint project groups throughout an interorganizational network (partnership arrangement), and it is essential that staff communicate with one another in a certain way in order that unique and creative solutions are found to solve complex problems. This focuses attention on the issue of operational effectiveness.

Operational effectiveness is, therefore, an important issue with respect to an organization achieving its objectives (Porter, 1996; Slater & Narver, 1995), and this demands that managers recognize real problems before they cause major concern to partner organizations. For example, as the level of dependency increases between organizations in a partnership arrangement, so too will the effort required vis-à-vis the sharing of information (Carlile, 2004). Inkpen and Currall (2004) suggest that as the level of dependency increases between the partner organizations, "partner willingness to provide access to information is likely to increase, thus providing the foundation for partner learning" (pp. 594-595). What emerges from this train of thought is that senior managers need to ensure that mutually oriented, trust-based relationships are built with internal staff (George, 1990; Lings & Brooks, 1998; Piercy, 1995; Singh, 1998) and with staff based in partner organizations.

According to Wong (2004), there is evidence to show that "social relationships facilitate interpersonal and intergroup knowledge sharing" (p. 647); however, unanticipated consequences need to be dealt with quickly (Feldman, 2004). A complex problem or uncertainty may be viewed as unique to an organization (Beckman, Haunschild, & Phillips, 2004, p. 260) and result in extensive knowledge transfer (Nickerson & Zenger, 2004, p. 623). Exercising can help with both these processes.

Business theory refers to the 'partner selection stage' (Bae & Gargiulo, 2004), for example, the degree of competition that is expected to materialize (Gnyawali & Madhavan, 2001, p. 433) among the partner organizations once a partnership arrangement is established. In the world we are describing, of course, organizations have little choice about the other organizations they will partner with. Most of them have monopoly positions (e.g., there is only one police force in a given area, only one operator of a given refinery, etc.), and their rights or duties in a given type of incident are often fixed by law. But it seems clear that exercises that develop relational trust between individuals also build relational trust between organizations.

Insights From Management Theory 3: The Management of Individuals

As regards the actual performance of a person during a simulation exercise or an actual event, it can be argued that if an individual perceives that his/her performance is not evaluated in an objective manner, they may feel neglected, become demotivated and decide not to develop their skill base and, also, their knowledge level. Exercises tend to have a high profile and to expose staff to working with senior managers whom they might not normally meet. People feel they are being tested and that their decisions will be noticed. Indeed, success or failure may well have career implications, and not being able to progress in one's career is something that can and does cause resentment.

Dysfunctional thinking may occur when individuals within the organization do not perform as expected, and also, organizational members may become demotivated and demotivate one another "through belittlement and insults" (Locke & Latham, 2004, pp. 392, 394). This may reduce the level of subjective judgment at the functional level and increase the level of objective judgment that reflects the organizational norms and objectives. This is known as collectivist trust that has been aggregated and accepted by members of the organization.

Senior organizational members need to stimulate members of staff throughout the organization and motivate staff to perform to their best ability. Staff need to be committed to the organization and to the emergency response process. Individuals need to be take responsibility for their learning strategy and identify any possible weaknesses that they have and that need to be eradicated via in-house or externally arranged training programs. This is more difficult for individuals in badly managed organizations, where there is a culture of blame rather than improvement. Such individuals typically tend to seek to avoid blame for any perceived failures on their part. In a small exercise, this can most easily be achieved by criticizing the exercise design since criticizing one's colleagues openly usually creates other problems. In a large exercise, criticism can also be made of other organizations. This can sometimes be done in guarded terms in public, knowing that your own organization will tend to close ranks and support you. It is more usual, and almost cost free, to do it in private. In the authors' experience, unsuccessful large exercises often lead to much expression of annoyance behind

closed doors: We did a good job, but they let us down, and so on. In most cases, this needs to be recognized as avoidance behavior and treated as such. Organizations with a learning culture tend to assume that mistakes will be made or shortcomings found and welcome the uncovering of weak points, which they promptly seek to improve.

According to Becerra and Gupta (2003), intraorganizational relationships are based on the characteristics of individual staff and result from specific linkages created in the organizational network. Hence organizations should have a monitoring system in place so that the organization can identify appropriate staff in advance and provide the necessary training and support to them, which allows them to reach their potential and represent the organization in the way expected. This is difficult in many cases, because for most organizations, responding to emergencies is not their normal work, and the characteristics and training required may be different from those that make a person excellent at his or her normal job.

Issues such as how staff maintain and share their knowledge with staff in partner organizations are key considerations. Staff can learn how to behave and make decisions through institutionalizing the knowledge gained. Organizations that increase the psychological capability of their staff can also provide learning opportunities and gain from emerging learning opportunities. This is because the process of interaction facilitates improvisation and learning (Miner et al., 2001). Exercises facilitate such linkages, not only during the exercise but also during the preparation period.

Taber (2008) states that

> if learning is to be relevant to the workplace and people's lives, if content is to be truly understood, remembered, and applied to actual practices, then learners must be engaged in active critical learning. (p. 517)

The full meaning of this becomes clear when one reads what Taber (2008) says further:

> Learners though respecting the experience of others, must also question what they are told. It is often the fresh perspective of a new organizational member that can lead to a critiquing of current practices and an improving of approaches. Questioning is not always welcomed, but a place should be created for this form of constructive learning in formal workplace training and everyday practice. (p. 517)

Taber (2008) also highlights the fact that in order to get the best out of those intent on developing their knowledge base, it is necessary to create a learning environment. This should ensure that those who undergo training are keen to engage with their teacher(s) and indeed their peers, if they are to be stretched intellectually and work hard to get the most out of the training/educational program.

By monitoring the performance of those undertaking the training/educational program, it is possible to provide, at the end of the period or at specific points during the

period of training/education, feedback that enables the individual to make more informed decisions. Extensive debriefing sessions are therefore a necessary component of knowledge transfer, and the process of debriefing is according to Taber (2008) "essential to support learning within simulations" (p. 520).

One way in which a team can develop is for senior organizational members in the organization to provide staff members with a degree of autonomy, so that they carry out their given tasks and learn to find creative solutions to complex problems. This is almost inevitable once individuals interact with others outside their own organization: They step out of their own hierarchy and join a small nonhierarchical team with others from different backgrounds. They are usually empowered to compromise and negotiate as long as certain key requirements of their own association are met. It is useful to state at this juncture that interactions and communication are viewed as similar but different, and it is the quality and the nature of the interaction that results in the generation of innovations (Roy, Sivakumar, & Wilkinson, 2004), which can be broadly interpreted as finding unique solutions to recurring problems. During the exercise itself, players typically continue to form multidisciplinary multiorganizational groups (e.g., the U.K. 'Gold, Silver, Bronze' system), which require members to have a measure of autonomy.

Crookall and Thorngate (2009) are right to suggest that "knowledge and action are closely intertwined" (p. 17) and that trainers and educators should think in terms of "'knowledge in action' and 'action in knowledge'" if, that is, they want to think in terms of how a learning process/environment is to be created. Crookall and Thorngate (2009) go on to suggest that

> simulation/gaming would appear to provide a channel through which people may pass from knowledge to action and back again, to develop the two together hand in hand, to make action-knowledge one. (p. 17)

In order to design more appropriate simulation exercises, it is necessary for academics, in particular, to pay increased attention to how simulation exercises can give rise to or incorporate theory and how the process of theory building can help academics work with practitioners and create more appropriate learning environments/solutions. What needs to be noted is that

> the problem of learning from simulation/gaming lies not in simulation/gaming methods, nor in the difficulty of measuring change (i.e., learning), but simply in the inability of humans to translate their knowledge into positive and beneficial action, whether it be in simulation or in ordinary reality. (Crookall & Thorngate, 2009, pp. 22-23)

The above highlights some of the characteristics associated with innovative learning. Innovative learning encompasses three different learning processes (the individual level, the group level, and the organizational level). It is interesting to note, when involved in the organization of a successful large exercise, how learning can occur at

each of these levels simultaneously, making it easier to harness new ideas and to create a localized learning culture. Large exercises provide a broader learning spectrum, though of course, with greater opportunity come greater risks.

Simulation and Training as a Science

We are advocating an interdisciplinary approach to simulation and gaming, which we believe will help promote a wider use and appreciation of the benefits associated with interactive learning per se. Indeed, Crookall (2000) is right to point out that "many simulation/games are interdisciplinary; the field of simulation/gaming is interdisciplinary" (p. 11).

This is not to say that every exercise organizer or participant should consider their work from theoretical or psychodynamic angles. Most have neither the time nor the inclination to do so, and many would regard such theories as 'academic' (in the sense of 'irrelevant'). But it is not necessary for individuals to engage in this way. For example, one of the authors has developed a software package that attempts to internalize psychological and organizational insights while making the production of exercises easier.

However, exercises as they now stand are not always felt to be satisfactory. Sometimes, this is for practical reasons, and sometimes, it is because organizers have neglected (or been unable) to engage with broader 'political,' organizational, or psychological issues of the sort we have described.

This article is perhaps unusual in that it is a collaboration between academics, a practitioner, and a clinician. Those working in the area of disaster and emergency management are normally drawn from a narrow range of professions. It can be argued that emerging bodies of knowledge, such as emergency response training, and indeed (as Crookall says) the whole field of simulation itself will benefit from a broader approach and that this will result in new approaches to 'large' exercise design and evaluation.

Conclusion

There is a qualitative difference between 'large' and 'small' exercises, as well as the more obvious quantitative one. While no precise definition of a 'large' or 'small' exercise is possible, the difference shows itself in several ways:

1. Large exercises are more 'experiential' precisely because they are less easy to control.
2. They are more likely to undermine any model of reality that single organizations may create.
3. They are more likely to create a 'play space,' a ritual in which organizations and individuals are acting out and expressing their own needs and identifications, and a ritual with strong social implications.

4. Group-analytic psychotherapy suggests that the emotions aroused in a large group may be stronger and more difficult to control. Individual or group emotions are usually ignored in the 'stiff upper lip' culture of exercise organization, but they are undoubtedly present and a major factor in the success or failure of exercises, as any practitioner knows.

5. Large exercises help improve the nature of trust between individuals and the organizations they represent, changing it from a situational trust ("He is a police officer so I have to work with him") to a personal trust ("He is a sensible man and I understand where he is coming from").

6. It is more difficult to learn from large exercises or to apply the lessons. This is often because there is usually no single person able to force the sharing of knowledge or to allocate and follow up the implementation of recommendations, and 'political' or practical constraints cannot be resolved.

7. However, large exercises and the process of preparing them can help develop organizations and individuals within them. Organizations gain from developing a more genuine partnership with each other and individuals from exposure to other systems and hierarchies.

8. Exercises (and simulation in general) need to be approached from a broader multidisciplinary direction if their full potential is to be realized, and novel solutions (such as exercise design software) need to be examined.

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