Commentary on "Understanding Mass Panic and Other Collective Responses to Threat and Disaster"

Emergency Evacuations, Panic, and Social Psychology

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Professor Mawson's article presents an updated and current understanding of panic and a fourfold typology of individual and collective reactions to threats and disasters. The paper, an expansion of Dr. Mawson's earlier writings on panic (especially his undated manuscript, which includes a somewhat similar typology; see also 1979), presents a near exhaustive review of the literature on panic and less so on other subjects, to show the real limitations in the use of the term. Its message, that despite variations in the nature of hazards and disasters people continue to be social beings who care for others and act pro-socially in the midst of dangers and grave difficulties is sound, as is his attempt to identify four ideal type response patterns or collective reactions to threats and disasters. In that sense, even if not fully successful, the article presents a worthy attempt to expand on Norris Johnson's pioneering contributions in this area (see below). In part, the problem I had with the article is derived from its multi-disciplinary focus, perhaps a reflection of Dr. Mawson's professional training in medicine, epidemiology, sociology, psychology, economics, political science, and public health, which in my opinion gives the article a sense of disconnectedness. I found myself in agreement with many of its parts but yet found it difficult to derive a holistic understanding of the main thrust of the article. The typology raises some confusion in my mind, for threats are not disasters nor are they necessarily associated with perceived physical danger; oftentimes people perceive threats in the absence of disaster, or do not perceive threats when in fact they are very much present, as in cases of nuclear contamination. Nor does perception of severe physical danger necessarily lead to terror and extreme fear, as witnessed by the highly organized, coordinated, and specialized activities of urban search and rescue specialists performing their duties in the midst of very unstable and dangerous collapsing buildings in the aftermath of disasters such as earthquakes and terrorist acts. Finally, the other dimension in the typology, the whereabouts of attachment figures (present or absent), has been shown in a number of studies in the social science of disaster to be much less important a determinant of people's disaster-relevant behavior than their knowledge that these significant others are safe and out of harm's way. There is a wide range of possible relationships between perception of severe physical danger and presence of attachment figures: at times, people who are very far from the danger exhibit quite a bit of apprehension and concern for their dear ones, while at other times, people near the source of danger show little concern for significant others. Perhaps many of these issues could have been clarified with a clear and unambiguous definition of affiliative behavior,

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which is missing from the text. Is it another way of saying that people live in social contexts and are attached to others?

As Mawson recognizes, current perspectives in collective behavior and the sociology of disasters assume the presence, in emergency evacuations, of heterogeneous actors acting normatively and rationally. Studies of panic come to mind. The oldest view of panic posited that people in dire emergencies lost their humanity and became animals overwhelmed by fear. A second view, sponsored by E. L. Quarantelli (1957) in the 1950s and 1960s, advanced a conceptualization of panic as asocial collective behavior. People did not become animals but rather attended to their own needs; they did not care about the fate of others. This view was replaced in the 1980s and 1990s by the work of Norris Johnson and other scholars (Keating, 1982) who pointed out that people did not panic, did not become animals, and did not abandon their ties to others. Instead, they continued to be social actors embedded in social organizations, continued to be deeply concerned for the fate of others so that they often imperiled their own lives on others' behalf (compare to Helbing, Farkas, & Vicsek, 2000; for an excellent review of theories of panic, see Chertkoff & Kushigian, 1999). Thus, we have come full circle in our understanding of these situations, and nowadays it is assumed that rather than panic—irrational, antisocial, or asocial behavior—it is social and affiliate behavior that takes place during crises and disasters and that at times increases the probability of death and injury.

Emergency evacuations, also referred as emergency egress and ingress, can be thought of as having three distinct analytical dimensions: the physical environment from which to evacuate, the managerial policies and controls deployed at evacuation, and the psychological and social organizational characteristics impacting the persons who participate in the movement. Dr. Mawson's article is couched mostly at the socio-psychological level of analysis, which in combination with an interest in social organization, socio-cultural emergence, ecological and situational factors, and social control could provide a more accurate understanding of these occasions. At the social organizational level, emergency evacuations are forms of collective behavior with two major types of social behaviors: first, culturally guided, institutionalized behaviors and socio-cultural emergent behaviors (Aguirre, unpublished manuscript; compare to McPhail, 1991) and, second, those usually corresponding to mass behavior and crowds. There are also two distinct stages in emergency evacuations that impact on the safety of evacuees: their decision to begin evacuating, and their actual evacuation behavior. Socio-psychological processes that we wish to examine impact both.

At the level of social psychology, the assumption of heterogeneous actors acting rationally and normatively has a number of important implications for our understanding of emergency evacuations. It has implications for the modeling of the direction of movement, which cannot be assumed to be unidirectional since it is rational and normative, and the product of symbolic interaction rather than the action of a herd or of robots. As Mawson recognizes, such movement includes people returning to the place they evacuated in order to help others, try to rescue friends, and salvage important belongings (Johnson, 1987a; Johnson, Feinberg, & Johnston, 1994). The ability to act rationally and normatively moreover is linked to the physical context of the emergency evacuation and to the nature of the hazard. It is useful to differentiate the physical settings along two dimensions: 1) Does the space allow the occupants to simultaneously perceive danger? Settings differ in the extent to which all potential evacuees receive the same warning and have access to the presence or signs of danger. At the extreme, everyone in the gathering is in the same space, can hear and see others, receives the same warning signs and perceives the danger. The opposite situation occurs in a setting in which people differ in the warnings they receive and in which the hazard as well as the perceived dangers are relatively slower in materializing. 2) The second dimension is the human density of the space. Settings in which potential evacuees are copresent, available to each other by sight and touch, and in which their density is very

high allow for the effect observed in many studies of emergency evacuation (Chertkoff & Kushigian, 1999, chapter 10), in which the response of the gathering of people to the perceived presence of danger and the sense of urgency to respond to the crisis is so immediate and overwhelming that the different propensities and choices of the individual evacuee and his or her group are largely erased. People's responses then become an important way in which others in the gathering are warned. The individual becomes part of a mass of people moving towards the exits, and the sheer press of people eliminates most possibilities for the individual to determine his or her movement. There is no time or space for people to develop complex lines of social action to help others in their groups. At this very unusual, extreme of mass behavior, often inappropriately called panic (Chertkoff & Kushigian, 1999), most potential evacuees and their groups do not have the opportunity to engage in decision-making regarding whether they should evacuate, with whom, when, and how. The distinction between group and individual-level emergency evacuation ceases to be meaningful, and the safety engineering and architectural features of the space in which such mass behaviors take place, such as building code regulations, visibility of exits, and the preparation, alertness, and quick response of social control agents, become the most important mechanisms impacting on the successful outcomes of such evacuations. Social psychological and social organizational group-level processes become much more important in other contexts in which this extreme context is absent, in settings in which all potential evacuees are not immediately available to each other visually and physically, in which there is much lower density, and in which there is variation in the warnings they receive and the signs of danger they perceive.

As recognized by Dr. Mawson, a good deal of research attention in studies of emergency evacuation has been devoted to the individual actor, particularly to the study of individual threat perception and individual decision-making under crisis situations (Perry, 1978). Individual-level models of evacuation behavior (Sorensen, Vogt, & Mileti, 1987) and evacuation decision-making by individuals (Perry, Lindell, & Greene, 1981, chapter 3) emphasize the importance of perceived threat (Sorensen, 1991, p. 157) and other factors that impact on an individual's ability and willingness to act. Typical of this emphasis is the statement by Ikle and colleagues (1957) that the decision of the individual to leave a threatening situation depends on the degree of perceived threat, the motivation of these potential evacuees—their withdrawal tendencies—and the factors that facilitate or impede their evacuation behavior, such as the perceived and or realized costs of evacuation. Fortunately, at the social organizational level, it has been possible to combine an emphasis on the social psychology of the actor (for an excellent review of this literature, see Parks & Sanna, 1999) with an interest in macro features such as norms, values, status demands, leadership, division of labor, and emergent generalized beliefs. Illustrative is Turner and Killian's (1987; see also Weller & Quarantelli, 1973; for a more recent version, see Stott & Drury, 2000) emergent norm theory (ENT) of collective behavior. ENT is based on a symbolic interaction conceptualization that emphasizes the importance of norms and social relations. It posits that nontraditional, collective behavior emerges from a normative crisis brought about by a precipitating event which, depending upon how the event is collectively perceived and interpreted by the participants, destroys, neutralizes, or no longer allows the preexisting normative guidelines, division of labor, power, and other social arrangements to be collectively defined as appropriate guides for action to respond to the crisis. The crisis creates a sense of uncertainty and urgency forcing people to act, and participants are forced to create a new, emergent normative structure to guide their behavior in the crisis. They mill about as they attempt to define the situation, propose cues for appropriate action, evaluate their relevant skills in terms of the new demands of the situation, and try out alternate schemes to solve the problem. Forced by the crisis to abandon their previously established social relationships, statuses, and nor-

mative guidelines regarding legitimate ways of acting, people engage in collective behavior to solve the problems created by the crisis, in the most extreme case (Weller & Quarantelli, 1973) in effect reconstituting groups and social relationships. ENT theory assumes the presence of heterogeneous actors with different backgrounds, relevant skills, perceptual abilities, and motives about what is going on, what should be done to respond to the crisis, and who is responsible to do what and when. ENT assumes that collective behavior is not irrational but social, normative behavior.

ENT does not incorporate an ecological view of social organization. Its focus is on social interaction in a collectivity of people. But in fact, multiple collectivities in multiple ecological settings are often key to understanding emergency evacuations. Thus, ENT must be supplemented by E. Goffman's dramatistic view of social life (1963). Following Goffman (for an excellent review, see Brown & Goldin, 1973, chapter 8), crises—what in Goffman's term are topics for focused interaction in encounters—disrupt culturally specified occasions in specific physical settings. There is an occasion and the gathering of people enacting it. Such gatherings are composed of single individuals and of small groups. Then there is the crisis, the precipitating event that starts focused interaction in an encounter and the period of the emergency during which emergency evacuation takes place. For Goffman, interactions in these encounters are face-to-face, rich in meaning, revealing, rapidly changing, augmenting "attention to detail, an intensification of mutual dependence, and an absorption in the interactive moment" (Brown & Goldin, 1973, p. 154), with people moving about facilitating information dissemination. Goffman argues that encounters develop two types of norms that regulate them and permit their continuation through time and space. These are rules of irrelevance and of transformation. The first helps people engaged in reconstituting their groups to identify what is relevant and irrelevant about their situation, what they must attend to; the second helps people incorporate into their social organizations extraneous items in such a way that the encounter is preserved (Brown & Goldin, 1973, pp. 155–156).

Groups have four types of characteristics. One type is the context in which groups operate, such as the built environment. A second comes from the aggregation of the characteristics of the members of the group, for example their average age or average physical agility, as well as those that are combinations of two or more aggregate characteristics, such as the group's sex ratio. The third type is illustrated by group density, which combines aggregate characteristics of the groups, such as their sizes, with contextual characteristics, such as the physical space the groups occupy. A fourth type of group characteristics is created by relationships, both present and past, among the members of the group, for example, conceptions of status, leadership, group cohesiveness, division of labor, communication channels, power arrangements, and the myriad aspects of group culture, such as language, cultural practices regarding personal space, traditions, and dominant norms, and institutions, such as law, regulatory agencies, and political units.

Important for our present efforts, it is possible to derive from ENT and from its expansion using Goffman's approach to social behavior in public a number of predictions for which there is some limited empirical support (Aguirre, Wenger, & Vigo, 1998). These are predictions in need of further testing and replication regarding the effects of social organizational variables on the timing of evacuation behavior and the movement of evacuating collectivities, for people most often participate in public spaces in which emergency evacuations take place in the company of significant others, in group contexts (Aveni, 1977).

One of these predictions is derived from Goffman's notion that there will be intergroup proselytism and competition for hegemony among the groups in providing the master definition of the situation and what should be done to respond to it. Such competition should delay the evacuation response: the greater the initial diversity of definitions in

the groups about what is happening and what should be done to respond to the crisis—to the extent that people are exposed to these competing alternatives—the longer it will take for people to make up their minds about what they should do (compare to Drury & Stott, 2001). Intergroup differences should also slow the evacuation movement in constrained spaces in which the groups cannot evade each other. Fire drills in high-rise buildings, in which there are multiple firms on given floors and in the building around which work groups form, would need to recognize the presence of intergroup competition during evacuation, in order to make such drills more effective in establishing a master definition of what should be the appropriate evacuation behavior that everyone in the building will follow irrespective of group membership.

A second set of predictions has to do with aggregate characteristics of groups, such as their size and heterogeneity (see below), which should impact their evacuation behaviors (Aguirre, Wenger, & Vigo, 1998). The size of the group faced with a crisis is an important determinant of its timing of evacuation; the bigger the group, the more difficult it will be for the group to decide to evacuate as a response to the crisis. It takes more time and effort for a large group to adopt a new behavior than for a smaller group; in the large group, there will be more variation, differences of opinion, and relevant experiences about what to do that must be reconciled before the emergent norm is created (compare to Kelly & Condry, 1965). Similarly, larger groups will move more slowly.

Third, groups also have implications for the evacuation movement or flow, for they will tend to move in a block formation that will create an order to the evacuation flow, particularly if such flow takes place in stairways or other constrained spaces. In such situations, solo evacuees, or people who decide to evacuate on their own and join the flow, nevertheless come in contact with the blocks formed by these groups of evacuees and are regulated by them, for they are exposed to the set of norms and new statuses guiding the behavior of these collectivities which they cannot evade. The order and regulation that is very often observed in large evacuations from multi-story buildings, such as the very successful evacuations from the World Trade Center towers in the aftermath of the 9/11 terrorist attack, is generated by the presence and movement of these groups in the stairways, which is very similar to the order and regularity of traffic flows in situations of very high vehicular density, in which vehicles move at the same lower speed and reduce changing lanes (Helbing & Huberman, 1998).

Fourth are group characteristics such as heterogeneity in age, gender, social class, physical health and vigor, and relevant experiences. Research is needed to understand how group heterogeneity impacts the decision to evacuate and evacuation behavior. Critical mass theory (Marwell & Oliver, 1993) would predict that groups with greater size and heterogeneity will be more likely to have members—who constitute the so-called critical mass—with the relative skills and resources needed to obtain the group's public good, namely surviving the hazard. Larger groups should have a greater probability of having a critical mass of able members. It can be derived from critical mass theory that groups are mechanisms people use to attempt to survive the hazard. Not everyone in the gathering has the same skills and resources, so that less-endowed members will benefit from the efforts of the stronger or more experienced members to bring about the escape, presumably a reason for staying with them. Moreover, it is immaterial to the strong and more able how many others benefit from their actions in facilitating the group escape; what matters most to them is their own survival, not excluding others from surviving. For non-mass behavior emergency evacuations, survival as a public good has "jointness" of supply, for the cost of providing it does not increase with the numbers of people who survive. Also, the usual crisis situations in which would-be evacuees decide what to do are suffused with ambiguity, making it difficult to develop an accurate assessment as to whether defecting from the

group will yield a higher probability of survival than staying with the group. Such evacuations are quite different from the widely discussed prisoner's dilemma (compare to Cornwell, 2003, p. 634).

Fifth, feelings of social solidarity, while not considered in critical mass theory, should also generate mutual assistance among members of evacuating groups. It can be expected that the acts of members of the critical mass that benefit others in the evacuating group are not only the indirect results of their calculations of personal benefits but also come about intentionally as they try to help others. A large body of scholarship in the social sciences of disasters reviewed by Dr. Mawson document that people faced with disasters and emergencies of all sorts become interdependent and cooperative, their actions taking into account the actions of others, restrained by the actions of others, so that in emergency evacuations they move together and assist each other. Social cohesion—a group-level effect created by social relationships, or the extent to which people know others in the group, have established social relationships with others prior to the crisis, and have friends and other close personal relations in the group—can be assumed to delay the collective decision to evacuate (Aguirre, Wenger, & Vigo, 1998) and to preserve the block effect during the evacuation movement. The lone actor and the free agent will decide to evacuate much more quickly than the social actor who is embedded in social relations, is concerned for others in the group, takes their opinions and interests into account before deciding when and what to do, and evacuates with the group.

Still in need of further research is the impact of group size and cohesion on the individual risk of fire fatality. Cornwell (2003; see also Feinberg & Johnson, 2001) has shown, on the basis of information on the Beverly Hills Supper Club Fire of 1977, that group size and social cohesion increases this risk, but his findings are in need of replication and expansion, for they do not control for the differences among the groups in their nearness to life threatening dangers, the resources of the groups' critical masses, and relevant differences in the built environment and the hazards precipitating the evacuation behavior.

Sixth, groups vary in the amount of resources available to them, and this variation will impact the start of evacuations. Paradoxically, our expectation is that the greater the amount of resources available to the groups, the slower will be their adoption of evacuation behavior, for it will take more time for the groups to agree on how to use these resources and integrate them into their new division of labor. Resources become items around which group dialogue ensues.

Seventh, perceptions of danger are socially determined. Dangerous conditions by themselves are not always effective triggers for evacuation response, except perhaps in situations of mass behavior previously identified, in which the evacuation response is forced upon the person. Instead, members of the group must interpret the situation as dangerous before they become a stimulus for collective action. Numerous studies of disasters indicate that there is a persistent and strong normalcy bias, in which people misunderstand the signs of dangers produced by the hazards and developing disasters and interpret them as normal features of daily routines. Such normalcy bias must be nullified before people will react to the crisis. Ambiguities and mixed messages and inaccurate interpretations of dangers often impact evacuation behavior, so that while it is true that the presence of intersubjectively verified and consistent signs of danger that are accurately perceived, such as smoking and loud sounds, facilitate the adoption of new behavior, this situation should not be assumed to be the normal state of affairs. The current explosion of electronic communication technology facilitates a flood of information to would-be evacuees that increases the ambiguity of the crisis situations, for these alternative sources of information often offer contrary alternatives to official information and directives and encourage a multiplicity of interpretations that impact decision-making in emergency evacuations, both at the individual and the group level. This is a problem that has received almost no research attention at present. Experimental results indicate that ambi-

guity facilitates suggestibility in crowds, and that suggestibility shortens the time to achieve consensus and facilitate the occurrence of more extreme consensus (Johnson & Feinberg, 1990). According to Leik and Gifford (1986), greater amounts of information increase the time needed to take protective action. Thus, it seems that greater information has multiple and somewhat contradictory direct and indirect effects on decision-making: a direct effect increasing the time needed for making decisions, while indirectly increasing ambiguity which in turn increases suggestibility, thus shortening the time needed for making decisions. Obviously, a great deal of further research is needed to clarify this matter.

Eighth, human imagination will impact the timing of evacuation behavior, particularly calculations regarding both their actual or perceived physical incapacities compared to the imagined demands of the physical tasks surrounding their evacuation. People are able to imagine the physical demands of their response to the crisis and thus respond in terms of what they think they can do within the time frame and other considerations that they consider relevant as they formulate responses to the crisis. Thus, the elderly, the physically infirm, caretakers, women, and the injured will have a greater tendency to begin evacuating sooner than other categories of victims and will have a higher probability of becoming obstacles to the evacuation movement in constrained spaces. Signs of dangers, such as smoke or fire, are thus filtered through these personal attributes and impact both the decision to evacuate and the evacuation movement.

Psychopathology is by and large not a relevant explanation of collective behavior in emergency evacuation. However, as the above section indicates, there are many key matters of interest to sociopsychological analysts of group behavior (Parks & Sanna, 1999) that could shed light on very important processes impacting the decision-making processes of groups faced with the need to evacuate and their evacuation movement. This line of research should be encouraged. Due to space limitations, let me close by mentioning just one other such process: leadership. Crisis contexts often neutralize pre-existing norms and power arrangements in social organizations. The new situation demands new leadership skills. Moreover, it is also a fluid social organization, in which leadership is very often unstable and in which the procedures for the exertion of leadership are not established. In these crises contexts, persons that become leaders of their groups are not necessarily those who conform to the norms of the groups, since the normative systems are in fact emerging. Nor are they necessarily the leaders of the groups existing prior to the precipitating event. It is more likely that the group member who will become the leader is the one who proposes an innovative solution to the collective problem that is judged plausible and credible by the other group members. Innovators will have a greater probability of being leaders in crisis situations with high uncertainty. Suggestively, Feinberg and Johnson's (1988) simulation study of crowds indicates that the agitator, or the person in the crowd with an extreme, innovative solution, is more likely to sway others in small gatherings, in highly ambiguous situations, and when others in the gathering trust him or her. Moreover, Johnson, Stemler, and Hunter (1977; see also Johnson & Glover, 1978), in another experiment, showed that there is a shift to risk, in that collective decisions are on average more extreme than the sum of individual decisions about the same item. The prediction is that group leaders will have the skills and knowledge and the innovative ideas that are perceived as maximizing the chance of escape for everyone in the group. Leadership is also impacted by the presence of culturally appropriate symbols of legitimate authority, such as uniforms and official-looking paraphernalia, although the success of the keynoting by social control agents will depend on the extent to which their suggestions are in agreement with the basic values and perceptions of the group that they are trying to lead and with the emergent leadership in these groups. It is an interactive and not a unidirectional process; official directives are often ignored because of inaccurate understanding by the authorities of the priorities and needs of the people (Stott & Reicher, 1998). Members

of groups involved in emergency evacuation have personal histories, skills, and other attributes that orient their interaction during the crisis and may eventually influence their willingness to follow the direction of the leader and the decisions the groups make.

To conclude, Dr. Mawson's article uses an accurate conceptualization of panic that can be improved upon by abandoning the concept of panic altogether and emphasizing instead the complexity of emergency evacuations as forms of collective behavior involving a number of distinct processes at the ecological, socio-psychological, and social organizational levels of analysis which must be integrated to generate a more reliable and valid scientific knowledge base regarding the dynamics of these occasions. A number of social-psychological questions are still unanswered in the study of leadership and in other dimensions of emergency evacuations that should be of interest to behavioral scientists.

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