Emotions in Crisis Management:

An Analysis of the Organizational Response to Two Natural Disasters

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Abstract

The impact of emotions on organizational performance during crisis response is examined. Data is drawn from the after action reports of individuals in two American Red Cross teams, one faced with responding to Hurricane Hugo and the other to the Loma Prieta Earthquake. Based on the texts generated by individuals in the American Red Cross who took part in these situations we examine whether the affective content varies across crises and individuals. These results have implications for understanding organizational response to sudden onset events with potentially catastrophic impact that could disrupt entire communities.

Keywords: emotion, organizational response to crisis, disaster management, American Red Cross, Hurricane Hugo, Loma Prieta Earthquake

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Traditionally, within studies of organizational decision making, there has been a discounting or neglect of emotions as a source of valid information and a corresponding emphasis on logic as a "cognitive bias". Discussions of organizational decision making speak of the rational, boundedly rational (March and Simon, 1958), or cognitive agent (Carley and Prietula, forthcoming). Organizational performance is seen as tied to the flow and quality of information (Galbraith, 1973; Cyert and March, 1963). Factors such as turnover (Price, 1977), organizational design (Baligh, Burton, and Obel, 1990), the environment (Lawrence and Lorsch, 1967), the organizational field (Powell and DiMaggio, 1991), and so forth are viewed as affecting the flow and quality of information and so the organization's performance. Indeed, much of organizational theory can be viewed as looking for a structural, institutional, environmental, economic, or resource bases for organizational behavior. Such a bases goes beyond the fundamental building block of organizations - humans - and overlooks a fundamental aspect of human behavior. To wit, humans are emotional.

While anecdotal accounts of organizational decision making are replete with examples of emotional and "non-rational" behavior, organizational theories tend to relegate the role of emotions to the unimportant. The study of emotions in organizations has been hampered by a resistance to acknowledge the presence of emotions in organizational life, an unapproving attitude within the scientific community, and a preference for rational models of behavior (Simon, 1987). In this paper, we take a tentative step to cover this gap in our understanding. We examine the role of emotions in organizational behavior. We present an overview on the role of emotions and draw implications for organizational behavior. We present a methodology for examining the role of emotions in organizations. Using this methodology, we empirically examine the role of emotions in two case studies American Red Cross team responding to Hurricane Hugo and to the Loma Prieta Earthquake.

This research is exploratory in nature. We investigate, using content analysis, narrative reports by personnel from one disaster response organization (The American Red Cross) prepared soon (within o ne month) of the event to ascertain the occurrence and

effect of emotion on organizational response. We study disaster events because they are settings in which the occurrence of emotion is likely and can be observed (Summerfield and Green, 1986). By examining the emotional content recorded in narrative retrospective reports of Red Cross personnel we gain insight into the potential impact of emotions on the organizational decision making process.

Emotions in Organizational Research

Studies of emotions demonstrate that they are pervasive and affect every aspect of life. Emotion is often described as any strong movement of the conscious mind or agitation of feelings or sensibilities. Emotion is seen to affect cognition (perhaps through a mitigation process; Carley and Newell, 1990), which is fundamental to decision making. Emotion can create non logical or irrational processes that reduce our cognitive capacity and, therefore, produce stress. Stress interacts with cognition to elicit dysfunction, counter productive behavior, and emotional response (Horowitz, Wilner, and Alvarez, 1980). Emotion and affective response can also emerge from the process of ***ongoing work*** activity (Sandelands, 1988). Such emotion or work feelings reflect the way work activity is experienced and are intrinsic to the work experience and not something extra. Emotion can lead to the formation of groups in order to satisfy individual needs for safety.

Some researchers make a distinction between feelings and emotions. Isen (1984, p. 185), for example, characterized feelings or feeling states as "mild, everyday affective experiences and represent pervasive, global, generalized affective components or states that influence seemingly ***non affect*** related events". In contrast, other research provides an implicit description of emotions as more intense than Isen's feelings and as having physical as well as mental manifestations. One might argue that feeling states occur quite frequently, often in response to seemingly small everyday occurrences, and without intense emotion. In contrast, emotions interrupt our thoughts and behaviors, are directed at past particular objects or events, such as a disaster episode and are characterized by intensity of effect. We do not make this distinction.

The vast literature on affect suggests that emotions or feelings can be characterized using at least two dimensions - evaluation (good-vs-bad) and potency (powerful-vs-powerless) - see for example the work of Ortony, Clore and Foss (1987). Many studies have demonstrated that there appear to be a large, although indefinite number of emotions. For example, Davitz (1969) located 400 words in Roget's thesaurus that he mapped onto 50 affect-related terms. Other studies have located anywhere from 28

affective terms (Russel, 1980) to 600 words with emotional connotations (Averill, 1975). Eight different approaches have been used to try to determine the number of emotions. These are: evolutionary (Hamburg, 1963; Plutchik, 1962; Scott, 1980), neural (Tomkins, 1963, 1982; Stanley and Jones, 1970; Izard. 1972, 1977), psychoanalytic (Arieti, 1970; Brenner, 1980), autonomic (Funkenstein, 1955, Stanley and Jones 1970; Fromme and 0' Brien, 1982), facial expressions (Fzijda, 1970; Ekman, 1973; Mallatesta and Haviland, 1982), verbal empirical classification (Lutz, 1982, Fehr and Russell, 1984; Davitz, 1969; Russell, 1980; Averill, 1975), developmental (Sroufe, 1979; Emde, 1980), and social-psychological (Kemper, 1987). All these studies are consistent with the finding that emotions can be classified in terms of potency and evaluation. This suggests that the distinction between feelings and emotions, a distinction primarily of potency, is a difference in level and not in kind. Therefor, we do not make a distinction between feelings and emotions in this work.

Emotions do have consequences for decision making. Emotions effect individual performance and are tied to individual's tendencies to engage in action (Frijda, 1987). The Yerkes-Dodeson law, for example, argues that the intensity of emotional arousal influences performance in an inverted U-shaped fashion. A moderate level of positive emotional arousal can improve performance whereas a high level of arousal, and particularly negative arousal can degrade performance. Izard, Kagen, and Zajonc (1984) note that negative emotions peak at lower levels of arousal (than positive emotions) and hence have more of an affect on performance. They also note that negative emotions can decrease the speed and accuracy of learning (whereas positive states can enhance learning), and retard cognitive and motor abilities. In other words, emotions affect individual performance, and negative emotions such as those that are likely to emerge in crisis situations affect performance negatively.

Organizational performance depends on the performance of individuals (Carley, 1992). If the members of the organization are suffering degradations in their performance due to excess emotions then organizational performance should suffer. If the members of the organizations are undergoing a slight emotional high then the organization should reap the benefits in terms of improved performance. For example, as individuals' ability to make judgments changes in response to their emotional state, the quality organivional decisions, which rely on those judgments, may change. Training and experience, however, should move individuals out of the realm of emotions, increase resiliency of individuals in times of stress, and therefor mitigate the impact of emotions on performance. For individuals, the nature of their emotional state is related to individual expectations of an event. For example, if accurate information is available so that a

person can expect an event that may elicit emotions, overt emotional behavior can be reduced. The less accurate the expectations of an event, the greater the likelihood that emotional behavior is to occur. In crisis situations, the increasing stress in the response organizations decreases the reliability of available information and so allows the opportunity for ambiguity and uncertainty. Training, however, should increase the accuracy of expectations and so mitigate the emotional response.

Emotions should be strongly present in organizations facing crises or responding to sudden onset hazards. Crisis situations are expected to invoke high levels of stress. Dror (1988) notes that the sources of stress include adversity, compressed time, mass-media images, allocation of limited resources, uncertainty. Such factors strain and stress the individual decision making and group processes. George (1986) notes that such stress results in impaired attention and perception, increased cognitive rigidity, shortened and narrowed perspective, and shifting the burden to the opposition. This affects organizational decision making such that greater resources are expended, authority is centralized, and a greater volume of casual explanations is generated (Dutton, 1986). The increasing complexity, ambiguity and uncertainty of problems which occur in turbulent hostile environments serves to further exacerbate the decision making process which has become the central organizational activity (Huber and McDaniel, 1986). Such studies document that stress is present and affects cognition; however, they provide little insight into the resultant impact on, and of individual emotions. Yet such stress should generate high levels of emotions. In particular, moderate crisis situation should invoke low levels of emotions, both positive and negative among members of response organizations. Whereas severe crisis situations should invoke higher levels of emotions and more negative emotions.

In organizations faced with mitigating the effects of severe crises, personnel should expect to experience high emotional levels. In this case, some degradation in organizational performance might be observed. In fact, crises do appear to degrade organizational performance (Rogers, 1986; Shrivastava, 1976; House of Representatives, 1988). While much of this degradation is attributable to information loss and distortion, lack of training, or poor organizational design part of it may be due to the effects of emotion on individual performance. Organizations faced with responding to the less severe crisis may actually exhibit improved performance. Anecdotal accounts of task groups, for example, often treat deadlines as low level crises and discuss the surge of adrenaline and improved performance prior to such deadlines. In response to some natural disasters, human beings respond remarkably well in an adaptive, responsible manner while under stress (Fritz, 1968; Dynes and Quarantelli, 1977; Drabek, 1968). The

impact of emotions on organizational performance, however, should be determined by the type of emotions present.

Most studies of emotions and crises focus on psychological reactions to the crisis event rather than on the effect of emotions on organizational performance. Nevertheless, such studies provide insight into the types of emotions that should be present. Such research indicates that most people show some sips of emotional disturbance as an immediate reaction to a disaster (Drabek, 1986) and that emotional response tends to move through characteristic stages (Singer, 1982; Thompson, 1986; Shore, 1986; Aptekar, forthcoming). Specific psychological reactions to a disaster not including the effects of long term stress (Kasperson and Pijawka, 1985) include anger, guilt, defensive behavior, fear of losing one's mind, and abnormal behavior resulting from medical problems and panic. Characteristics of crises can arouse acute anxiety and other strong emotional feelings such as fear, shame, anger and aggressiveness (George, 1986). Aptekar (forthcoming) notes that the first stage of emotional response is characterized by the display of anxiety and confused thinking. The second phase starts when people begin to mentally take control and try to give themselves more power over the situations which had made them powerless. As people reorganize their thinking they seek explanations for past stressful events. These people may attribute the event to divine intervention, distort the memory of the disaster, or simply deny the magnitude of the disaster and their response to it. With the passage of time to assess losses, victims begin to express their anger. This is a delayed reaction, unlike fear, which is an early response. The anger response is accompanied by uncertainty, a sense of helplessness and an accumulation of frustration. The final stage of coping after the expression of anger is finding a resolution to one's problems and leaming to accept the new losses. Life moves on no matter what form of help might be available. These phases of disaster response and recovery develop uniquely with each occurrence of disaster.

Different types of disasters effect different psychological symptoms and social processes among victims (Frederick, 1980). For example, victims of human induced violence are found to experience guilt about the plight of other victims and about not preventing the event, identification with the aggressor, reluctance to return to the scene of the event, feelings of loss and rejection by other members and doubt by others about the genuineness of complaints. Whereas, victims of natural disasters often express incredulity, shock, and search for a source to blame. For all disasters, the mental health of both victims and response personnel may be impacted. Further, psychological and social responses may vary based upon individual differences, such as age, sex, ethnicity, personality, and prior mental health (Drabek, 1986).

Further, for disasters, sudden onset events produce more stress in victims than do events where warning exists. For response workers, however, the suddenness of the event is not the critical factor in affecting emotional response. Rather, the stress of the relief workers is highly correlated with the conditions that they must endure, and the likelihood of a secondary disaster (such as aftershocks). Living without power or water, dealing with a different culture all contribute to the stress felt by relief workers.

Analyzing Emotion

In this paper, rather than documenting the emotions of victims, we look at the emotions of the individuals in the response o rganizations. One way of examining emotions within organization is by examining the presence of emotions within organizational documents. Within organizations emotions are often present in expressed behavior, i.e., in the written documents generated within the organization. Such expressed behavior is a form of communication with powerful (Rafaeli and Sutton, 1989) and long term effects (Kaufer and Carley, 1993) on other individuals. For the organization, written documents serve as institutional memory (thereby, influencing future organizational action) and as a bases for evaluating the organization. Emotions- expressed in such documents may serve to modify or control the behavior of other organizational members and the organization as a whole. By examining the emotions present in such documents we gain insight into the nature of the expressed emotions, and therefore their potential impact on individual, and thus organizational, performance. Observing the expressed emotio ns provides insight into the organization's ability to achieve its goals at the time the document was written given the extant emotional situation within the organization.

Emotions are expressed in documents by wordsl. To extract emotions one would extract emotion words using content analysis. Content analytic techniques have been used in the social sciences to explore a diverse range of topics; including, but not limited to symbolic use of information in the Congressional Record, international political crises, therapeutic emotional states, corporate social responsibility in annual reports, operating room conversations, and advertising content of children's television (Mahl, 1959; North, Holsti, Zaninovich and Zinnes, 1963; Culnan, 1988; and Wolfe, 1989). Traditional content analysis is concerned with counting words. The result of the analysis is a matrix of texts by concepts with each cell indicating the number of times that concept was used

We use the term word loosely to refer to an ideational kernel, e.g. love, hate, siLsjown. Alternatively we could have used the term "concept." The reader should keep in mind that our "words" may at times be phrases representing a single idea.

in that text. Content analysis has proved valuable in looking at broad cultural shifts or differences across texts (Namenwirth and Weber, 1987). Such analyses have provided little insight into the cognition of the text's author. When the focus is on the individuals and not the over-riding culture, techniques that go beyond counting concepts are called for (Roberts, 1987; Carley and Palmquist, 1992; Carley, 1993). It is an open question as to how to extend content analysis in order to deal with emotion words.

A possible extension is suggested by the work of Heise (1977, 1979, 1983, 1987). Heise following in the work of OTtony, Clore, and Foss, notes that all words have some affective connotation. Heise characterizes the affective content of words using three dimensions: evaluation (good -vs- bad), potency (powerful -vs- powerless), and activity (lively -vs- quiet). A word's position in the evaluation, potency, and activity space is referred to as its EPA rating. Heise has demonstrated that individual's action can be predicted by considering the affective dimensions of other individual's actions and the situation. In addition, he has demonstrated that the affective profile of a situation can be characterized by considering the position of all effectively related words on these three dimensions. The emotion profile defines the range of emotions portrayed by the individual on these three affective dimensions. The importance of such dimensions to the organizational researcher is that they give the researcher a way of identifying the affective dimensions of a text and of combining in an analytic fashion words with similar affective content.

In this paper, we move somewhat beyond the classic content analytic tradition by relating the located emotion words to their EPA ratings. The result is a matrix of texts by concepts with each cell indicating the number of times that concept was used in that text, plus a matrix of concepts by EPA ratings. Based on this information we generate the emotion profile for each text in our data base.

DATA

There are two types of data that we draw upon in this study - retrospective after action reports and EPA values.

RETROSPECTIVE AFTER ACTION REPORTS - HURRICANE HUGO AND THE LOMA PRIETA EARTHQUAKE

The raw data is the set of narrative reports filed by American Red Cross personnel soon after their tour of duty following Hurricane Hugo and the Loma Prieta Earthquake. Many of these reports are filed by senior managerial personnel acting as officers for a particular area of response such as communications or training. Other reports are filed by

middle level managerial personnel. The breakdown of types of reports by crisis are reported in Table 1.

*** Place Table I About Here

On September 19, 1989 Hurricane Hugo struck the U.S. Virgin Islands and Puerto Rico; several days later the hurricane reached the U.S. mainland and devastated the coastal areas of South Carolina. Ile American National Red Cross and the Federal Emergency Management Agency were still deeply involved in relief operations in South Carolina and the Caribbean when the Loma Prieta earthquake shook northern California on October 17, 1989.

The magnitude of the Red Cross's administration of three concurrent but geographically separate disaster relief operations can only be appreciated when it is compared to normal operations. During a typical year, the Red Cross assists approximately 50, 000 families and distributes approximately $25 million in disaster aid. In the fall of 1989, the Red Cross provided almost $100 million in disaster assistance to approximately 150,000 families. Obviously, this level of response and service delivery was not attained without significantly stressing Red Cross personnel and systems.

The Red Cross did not have enough experienced people to meet the long term staffing requirements of the 3 simultaneous operations. Over 3,100 Red Cross workers were recruited from outside of the disaster areas but many of these were marginally qualified for the job ahead (Harrald, Abchee, Cho and Boukari, 1990). Local Red Cross chapters recruited many more local volunteers. The administrative staffs at the disaster relief sites had to integrate large numbers of inexperienced personnel into a major relief operation. The creation of an effective relief organization was a major challenge.

In Hurricane Hugo (like Hurricane Andrew) the Red Cross workers lived in hotels without power and water. The damage was extensive and geographically dispersed. In Loma Prieta the workers were coping with aftershocks. However, the earthquake damage was localized. For the most part, relief workers commuted into the disaster areas from areas that were minimally affected. Given the higher levels of physical stress facing the relief workers for Hurricane Hugo, we expect that these workers, will show greater emotion in there reports.

American Red Cross (ARC) directive 3015 establishes the requirement that narrative reports be submitted for all major disaster relief operations. This instruction also defines the purpose, content and format of the reports. Ile narrative reports are intended for use by the ARC, by academic researchers, and government agencies. "They must contain vital information critical as well as positive on all aspects of the operation." Red Cross relief organizations are organized into a senior staff, support functions and direct service

functions (feeding, shelter, family service, disaster health, and disaster welfare inquiry). Administrative narratives are written by the senior managers for the disaster relief operation: the operation director, deputy director, assistant directors, and district directors. Functional narratives are required from "the senior supervisor of each function". If "significant activity or events have occurred during the incumbency of more than one person," multiple narratives may be required.

The simultaneous, prolonged relief operations in the Caribbean, South Carolina, and California in the fall of 1989 resulted in an outpouring of reports. The 96 narrative reports submitted by multiple officers and non-officers from multiple jobs fill three 4" loose leaf binders. This material formed the database for our research. Within these cases individuals use words that indicate their affective state.

Following are a series of three examples of this data, each drawn from a different report.

Example 1:

"One night D.A. personnel were up until 2:00 am. using copying machine to have street sheets available for F.S. - Centers open in the am. Some books were copied for the time due to being misplaced or lost by others than D.A. Our master book was removed after hours from Headquarters and parts found distributed to two different Service Centers. Many anxious hours later and miles they were recovered; however, not without much frustration."

Example 2:

"The combination of stress due to losses, raised expectations and the inadequacy of our response, resulted in angry, aggressive behavior toward the trained Red Cross workers who ultimately had to deal with those consequences."

Example 3:

"With few exceptions, the officers on this operation deserve a great deal of credit. Most had to contend with untrained supervisors, shortage of supplies and some staff, at times, living in poor housing yet they were able to get the job done. The pressures took there toll on some, we were completely overwhelmed at first and a few could not cope. But generally, the people who were chosen as officers were good choices."

EPA VALUES

Based on decades of data collection Heise (1987) has generated dictionaries for affect related words that list for each word its EPA rating for both men and women given a

particular country. Each affective concept, as noted by Heise (1979, 1987), has an EPA rating. An EPA rating is a set of 3 numbers which denote that concepts rating on the three affective dimensions - Evaluation (good vs. bad), Potency (powerful vs. powerless), and Activity (lively vs. quiet). Heise uses a scale ranging from 4 to -4 for each of the three dimensions. These ratings differ depending on whether the actor (in our case the individual generating the after action report) is a man or a woman, and the actor's country of origin. The EPA ratings am based on empirical studies. Heise's dictionaries represent a wealth of accumulated empirical finding on the affective content of words. We will use the EPA ratings found in Heise's behavior and modifier dictionaries for the United States culture as available in INTERACT (Heise, 1979,1987). For example, within the INTERACT dictionaries the concept abandon has an evaluation rating of -2.56 for men and -2.59 for women; a potency rating of -0.78 for men and 0.53 for women; and an activity rating of 0.92 for men and 0.32 for women.

RESEARCH METHODOLOGY

In order to examine the role of emotions in affecting performance within organizations we will examine the emotion profiles of all American Red Cross members who generated after action reports for either of the two crises. Emotion profiles will be generated by analyzing the emotional content of the reports generated by these individuals.

These 96 reports were converted into digitized forms for computer analysis. A computer-aided content analysis of the text was conducted to ascertain emotional communications. Words like "fear", "anger", "sadness" and "joy" were located and assessed, both as individual occurrences and within the context of a phrase, sentence, theme, paragraph, or whole text. The procedure followed is now described in detail.

Step 1: The narrative retrospective reports were optically scanned, then read using optical character recognition software, and visually reviewed for errors. The resulting ASCH file was searched and sorted by keywords using the text management software Folio Views. These words were selected from reference guides, mainly The American Psychological Association Thesaurus of Psychological Index Terms, The Modem Dictionary of Sociology, The Modem Guide to Synonyms, Roget's Thesaurus and Webster's New International Dictionary. The resulting files were narrative segments containing one or more of the key words. These segments formed the database for our analysis.

Step 2. We constructed a complete word list. First we constructed a list of all concepts listed in the Heise behavior and modifier dictionaries. To this we added a list of all words identified by the researchers on the basis of 5% of the cases as being related to affect or cognition. Then we added to this list all words grammatically formed by adding plural's, tense or various endings such as "ed", "ing", "ship", "ly", and "ies". This set of words formed the complete word list. There are a total of 7672 words in this file. We refer to these words as the secondary words.

Step 3. We then constructed a master thesaurus file. Ile 7672 secondary words are then classified into a thesaurus by associating each with a base word as found in the dictionary. In the master thesaurus file there are 1040 base words. Each secondary word is categorized under a single base word. An example from this master thesaurus is:

WANT (base word) - want, wanted, wanting, wants (secondary words)

Step 4. For each text we counted for each word in the complete word list how often that word occurred in the text. These counts are based on complete list of all secondary words. That is, if the word in the text is "socialite" and the word in the word list is "social" then we did not count it as an occurrence of social. The perceived goals of the relief operations and the structure of the response organization provided the background for the analysis of these informed observations. Each occurrence of an emotion word was interpreted in the context of the disaster relief effort, the organization and the specific sentence content.

Step 5. For each base word in the thesaurus we calculated its cumulative sum as the sum of the occurrences across all of the associated secondary words.

Step 6. We then reduced our complete word list and the thesaurus to include only those words that occurred in one or more of the texts. After this reduction there were 1064 words in the complete word list and 450 base words.

Step 7. For each of the remaining 450 base words we located its EPA rating in the Heise dictionaries. All but 63 of the base words had values in the Heise dictionaries.2 If the base word did not occur in the Heise dictionaries then we located the EPA rating of all of its secondary words. We then constructed a rating for the base word as the average of the rating available for secondary words. This procedure provided EPA

2 If a word occurred in both the modifier and behavior dictionary we averaged the EPA ratings from the two dictionaries. There were only seven such cases.

values for 37 more base words. After this the 26 remaining base words for which we could not locate an **EPA profile were deleted from the data base.** This left us with a total of 424 base words for which we have both frequency counts and EPA ratings.

Using this seven step procedure we coded each text. The result is a matrix of texts by concepts and another of concepts by EPA values.

Results

The two disasters used as a basis for this analysis could be expected, a priori, to produce different emotional responses. Rapid onset disasters such as earthquakes and tornadoes produce a greater degree of emotional trauma than do disasters that provide some warning such as hurricanes and floods. Ile perceived randomness, of the impact of rapid onset disasters and the fear of an immediate reoccurrence (aftershocks or a second tornado) add to the emotional impact of these disasters. This differential in general emotional reaction can be seen from the fact that the Red Cross disaster relief fund raising efforts historically have been much more successful for rapid onset disasters than have efforts for the more destructive hurricanes or floods. Ile Red Cross disaster relief costs of Hurricane Hugo were twice the relief costs required for the Loma Prieta earthquake. However, significantly more donated funds were designated for earthquake relief than for hurricane relief. We expect, therefore, that the analysis will show a generally higher level of emotion reported for the Loma Prieta earthquake response than for the Hurricane Hugo response.

We find, however, remarkably little difference in the affectual response of individuals in the two response units (see Table 2). More of the words tend to be high in evaluation (good) rather than low (bad), high in potency (powerful) rather than low (powerless), and high in activity (lively) rather than low (quiet). In this sense, the reports tend to be upbeat and project a generally "positive" emotional image. However, the affect words used tend not to be extreme in nature; i.e., the EPA values tend to fall closer to the middle of the range (0) than to the ends of the range (-4 and 4). This suggests that individual's responses, and therefore presumably behavior, are not being controlled by extreme emotions and that the emotions that do occur are positive.

*** Place Table 2 About Here

In contrast to the expectation, there are actually more affect words used in reporting on Hurricane Hugo than on the Loma Prieta Earthquake. Further, there is a slight

tendency for Loma Prieta respondents to use words higher in evaluation (good), potency (powerfulness), and activity (liveliness).

There are differences in the two responses in terms of what specific words are used. These differences can be highlighted by considering those words that are unique to a specific response. In Table 3 we see that the number of words used exclusively in reporting on Hurricane Hugo exceeds those used in reporting on the Loma Prieta Earthquake. In terms of the unique words used the Hugo reports exhibit a more negative and powerless affective level than the Loma Prieta reports. Frequently used words occurring only in Hugo include sincere, enjoy, tired, pass, and authorize. For Loma Prieta such words are play-with, condemn, outgoing, rescue, and discriminate. These differences can also be observed in the distribution -of words used across the EPA dimensions.

Place Table 3 About Here

In Figures 1 and 2 the distribution of the percentage of response workers who employed a base word with a particular EPA rating is shown. Since there is little difference between the two events in the activity level of the emotions used, we display usage relative to only evaluation and potency. Viewing these landscapes we see that the bulk of agreement in Hurricane Hugo (Figure 1) is in the use of concepts high in potency and only slightly lower in evaluation. Whereas, in the Loma Prieta Earthquake (Figure 2) the bulk of the agreement is a little lower in both dimensions.

Place Figure 1 About Here

Place Figure 2 About Here

Organizations present their own unique characteristics through their culture, functions and goals. This culture is reflected in the reports through the choice of particular words. In addition, work feelings associated with doing a job, and not the peculiarities of the situation are present prior to any additional behavior or responses that disasters may elicit. Words reflecting these work feelings will also be present in the reports. By locating those words that are common across all reports regardless of the crisis we can gain insight into the general culture of the organization. Those words that are used by 50% or more of the respondents in both Hurricane Hugo and the Loma Prieta Earthquake are supervise, experience, leave, support, help, good, inform, use, assist, train, need, work, and serve. These words clearly are more cognitive than emotional, and represent the overriding concern in the reports. What is striking vis emotions is that in neither crisis was there a word used by 50% or more of the workers that was a clear example of an emotional term (e.g., love, hate, anger). Such clear examples of emotional response

were rarely used, when used were used by only a few individuals, and were more frequently used in reporting on Hurricane Hugo.

A disaster relief operation is an emotional and stressful event for relief workers. However, top management, middle management, and service delivery workers are subject to different stresses. Top management must deal with the problems of establishing a functioning organization, mobilizing and deploying resources, and making important strategic and tactical decisions. Relief workers who deal directly with disaster victims must work long hours with traumatized persons and the stress that this causes is well documented. Middle managers have some direct contact with the victims and must also deal with resource allocation problems, implementation problems, personnel problems, and general information overload. In this paper top managers are represented by the disaster director and his or her key assistants. All other narrative reports were written by middle level functional managers.

Although the fear of aftershocks affected all workers in the Loma Priem response, top managers were subjected to an unusual stress level. The Loma Prieta disaster and its response was a media and political event. It occurred, literally, on national television in a major media center. Red Cross top managers were under a unique and continuing public and political pressure to justify their actions. During the Hurricane Hugo response, on the other hand, workers were not subjected to a fear of recurrence nor was there intense media criticism of relief efforts until well after the event. All relief workers were, however, subject to a unique set of stresses. In the Virgin Islands the destruction of the infrastructure required disaster relief managers and workers to work long hours and to exist for weeks with water and electricity. In Puerto Rico non Spanish speaking workers and managers faced the communications obstacles as they attempted to conduct relief efforts in an unfamiliar cultural setting. The Caribbean relief effort was also subject to tenuous logistics support and long supply lines. These factors, however, tended to affect top and functional managers in a similar manner.

In table 4 we see that top managers in the Hurricane Hugo response tend to use the more effectively related words in their reports than did any other group. Top managers in Loma Priem, who were under public scrutiny, tended to utilize on average more good and powerful affective words than did top managers in Hurricane Hugo. This would suggest that the Loma Prieta top managers are attempting to portray an image of activity in their after action reports that is consistent with a story of "take charge" and "doing good" that they would have wanted to portray to the press during the response. Middle level Loma Prieta managers utilize more good and lively words than do their counterparts in Hurricane Hugo. This is consistent with a story of "doing good" and "getting things done"

that they would have wanted to portray to the press during the response. Members of the Hurricane Hugo response team, were not under this kind of press pressure during the response. Moreover, the relief operation was greatly overwhelmed by the scope of the event. Thus, the written reports are less upbeat. Further, the commonalty of extreme pressures across managers in Hurricane Hugo led to a commonalty in their feelings of power and liveliness. However, the severity of the hurricane was more felt by the top management whose reports am lower in evaluation.

*** Place Table 4 About Here

Finally, let us consider the differences in the affective response of the directors for the two response efforts. These differences are summarized in Table 5 below. We see that the director of the Hugo responses uses a wider range of affective words and uses more affective words. The range and mean of the words used, on the three dimensions, are essentially the same for the two directors. However, if we look at the distribution of the concepts used we see that they are different (see Figures 3 and 4). The Hugo director uses more words high in evaluation and they are more tightly clustered in terms of potency than are those used by the Loma Priem director.

Place Table 5 About Here

Place Figure 3 About Here

Place Figure 4 About Here

Discussion

The results of this study must be viewed with caution. Use of after action reports to examine affective impact on organizational behavior is fraught with difficulties. For example, the intent of these narratives is to illuminate the issues inherent in disaster relief operations and to better plan for future occurrences of similar events. T'he reports are best viewed in the context of the organizational goals and objectives during the disaster response to the two events. In many cases explicit use of words is inadequate to convey the complete culture or emotional behavior.

Further, these reports rely on human memory. Retrospective dam is data which develops as an informant reviews or refers back to an event, activity or behavior which has already occurred, as contrasted with an event, activity or behavior which is running parallel or occurring at the same time. When the researcher relies on surveys of the past or the use of recall and report in lieu of alternative forms of field data collection such as participant observation or interviewing, the resulting data is subject to additional considerations of accuracy.

Relief workers' reports were prepared retrospectively approximately one month following the occurrence of the disaster event. The emotional content of human behavior declines rapidly after the event. Because these reports were written later much of the emotional impact is less noticeable or has ceased to exist. Alternatively the very existence of observable emotionally relevant behaviors in these documents provides an indication of the strength of the affective component which existed during the disaster response.

From a broader perspective there are additional considerations for the results of this research. Retrospective narrative reports are subject to relief workers' ability to review and reconsider past events as filtered by their individual perceptions. The textural content of the report is then the result of the workers' ability to express himself/herself in the English language which reflects individual life and disaster relief experiences. There may be more information reported than the simple reflections of the disaster relief situations which were encountered. Such individual competencies and differences directly influence the nature, comprehensiveness, relevance and research utility of the narrative reports.

It could be argued that the concept of emotion with psychic and physical components would be better researched by an implicit content analytical approach. This is a research question for further exploration.

Whether research is conducted using only the explicit information (as in this study) or using the additional implicit information, examining the role of emotions in organizational performance is difficult. The difficulties stem, in part, from the need to examine a large number of verbal protocols. Simply reading and counting words by hand is not a feasible solution. It is necessary to turn to automated and semi-automated procedures for processing the texts. Even so, collecting emotion profiles is an intensive task. A major portion of the effort went into collecting the concept list and thesaurus. Hopefully, future studies will benefit from using these lists. A second major portion of the effort went into processing the texts to count the occurrence of words in these lists in the texts. This latter process was automated. This automation made it possible to examine a large number of texts and to be fairly exhaustive in the number of concepts we examined. However, this automation also generated several difficulties that future studies will need to overcome. We will address three of these.

First, the use of only base words may be misleading. The essential problem is that different secondary words for the same base word may have somewhat different EPA ratings. So coding only by the base word may actually decrease the variance in overall emotion profile. Ile main advantage of using base words is that the concept list is shorter and so comparison across cases is easier. A secondary advantage is that data storage is lower.

Second, emotion profiles may be biased as they may include not only the individual's feelings but also the feelings of others that the individual is reporting. In this study we simply automatically counted up the firquency with which the words occur. There was no attention to context. Thus comments such as "I feel devastated" and "The flood victims are devastated" have equal impact on the individuals emotion profile. For crises such as these one might expect that the reporting individual has a certain degree of empathy for the victims. Consequently this inattention to context may effect less bias in the results in this study than it might in others. Nevertheless, future studies should address this concern.

Third, there are only two crises and for both we are dealing with the same organization, the Red Cross. Since we have almost 100 cases we can begin to examine the difference between individual emotion profiles when faced with the same situation. Indeed, we did this in this study. However, with only 2 different crises our claims about the relationship between emotions and organizational performance are perforce limited. Future studies should examine multiple cases. A major difficulty, however, is gathering performance data.

As final comment, both cases are drawn from response to natural disasters. Three categories of disasters are typically delineated: natural, technological, and social (Kreps, 1986).3 Circumstantial examples are: natural (earthquake, hurricane, flood, drought, and tornado), technological (oil spill, toxic release, pollution), and social or man made (epidemic, economic depression, civil unrest, terrorism and war). Studies have shown that the ma or burden of crisis management in developed societies has shifted to risks arising from technological development and application (Kasperson and Pijawka, 1985). However, the conclusions reached in this paper should be applicable to disasters of any type.

Despite the set of limitations just discussed this study is valuable. It demonstrates that empirical techniques can be used to gage the level and type of emotions present in an organization. Using such techniques the relative behavior of multiple organizations can be contrasted.

Conclusion

3 Related research themes focus on disaster classification schemes (Berren, Santiago, Beigel and Timmons, 1989), disaster factors (Berron, Beigel, and Ghertner, 1980), and types of technological hazard events (Kasperson and Pijawim, 1985).

We have presented an exploratory analysis of the relationship between affective response and organizational performance. This study utilizes EPA ratings to relate the affective content of organizational documents to organizational performance and the organizational status of the author of the document. Unlike previous studies of emotions in crises, we have focused on relief workers rather than victims. This focus allows us to begin to address the role of emotions in affecting organizational behavior. We have focused on the occurrence of emotion and discussed how it varied by event and level of management. Two obvious additional research questions are: (1) how does the existence of emotion affect the decision processes and organizational behavior, and (2) can we prescribe guidelines to capture the positive energies elicited by emotions and to minimize the negative impacts resulting from these emotions? Further research in this area needs to explore the relationship between emotions and organizational decision making in response to a disaster (Carley, Cohn, Harrald, and Wallace, 1990). In particular, this research should focus on the impact of emotions on situated learning and cognitive activity and the impact of emotions on group actions.

In terms of cognition, emotion can stimulate the need for adaptive effort, it can interrupt less salient activity and produce arousal, it can interfere with cognitive activity and it may foster premature closure and responses (Folkman, Schaefer and Lazarus, 1979; Hamilton, 1979). In terms of group behavior, emotions can. stimulate the need to form groups, and to engage in actions with adverse social consequences (Szilagyi and Wallace, 1987). Through cognitive coping processes there develops an effort to regulate (in reverse) the emotional response itself. Research on the capacity of emotions to interfere with cognitive processing has focused, for example, on the study of test anxiety, on the restriction of cue utilization and on the positive and negative effects of anxiety. This literature suggests negative emotions which are to be expected during the crisis response period (Summerfield and Green, 1986) are expected to have greater ability to affect performance, to decrease the speed and accuracy of learning, and to retard cognitive and motor abilities(Frijda, 1987, Izard, Kagen, Zajonc 1984).

This suggests that emotions and organizational coordination intermingle to affect organizational performance, and that this intermingling is particularly strong during crisis periods. This intermingling can affect communication and performance. Emotions which are expressed or displayed serve as a form of communication between individuals in organizations (Rafaeli and Sutton, 1989). Crisis situations should invoke not only high levels of emotion, but also high levels of negative emotions. Performance should be poor in organizations faced with mitigating the effects of crises. In fact, crises do appear to degrade organizational performance (Rogers, 1986; Shrivastava, 1987; House of

Representatives, 1988). While much of this degradation is attributable to information loss and distortion, part of it may be due to the effects of emotion on individual performance. However, emotion based communication and emotions themselves may not necessarily degrade performance. Reviews of actual crisis experiences showed that humans respond remarkably well in an adaptive, responsible manner to the extreme stress found in disaster situations (Fritz, 1968; Dynes and Quarantelli, 1977; Drabek, 1968).

Further, the negative emotions present in crisis situations encourage the formation of groups. One of the reasons to form groups is to more adequately satisfy individual needs such as safety and security which occur in a crisis situation4 (Szilagyi and Wallace, 1987). Crisis situations engender an environment which is conducive to the formation of groups which can meet newly created needs. Research has shown that at such times concerned individuals gather to exchange information and ideas. This group affiliation or identification is a collective behavior which occurs when people are exposed to external danger (Janis, 1963). That does not mean, however, that the groups which form are effective or even the most effective response to an emotionally charged situation.

In a crisis setting by recognizing the potential impact of emotion on cognition, and, group formation, and therefore on the quality of decision making it may be possible to positively effect post-event activities. A reduction of the time and effort devoted to response and recovery can be attained: by improved design of organizational processes (Smart and Vertinsky, 1980), and by employing decision aids to increase information processing (Belardo, Karwan and Wallace, 1984).

As we previously noted, organizations present their own unique characteristics through their culture, functions and goals. Specific combinations of these elements may be more effective than others in facilitating the process of change during the organizational transition, necessitated by response to a disaster. Research that considers the role emotion plays in problem solving and decision making in crises can provide insight and guidelines for organizational change.

4 Additional reasons include task accomplishment, problem solving, and proximity and attraction.

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Table 1: Distribution of Reports by Crisis

	Hurricane Hugo	la Prieta Earthquake
Total Reports	65	31
Reports by Top Managers	28	16
Reports by Middle Managers	37	15
Reports by Men	49	15
Reports by Women	16	16

Table 2: Average Affective Response by Crisis

	Hurricane Hugo	Loma Pneta R=-hquake
Average number of distinct base words per text	42.11	38.65
Average number of times each base word used per text	2.67	2.63
Minimum evaluation rating	-3.80	---------3.80
Average evaluation rating	0.64	0.75
Maximum evaluation rating	2.88	2.77
Minimum potency rating	-2.52	-2.52
Average potency rating	0.84	0.88
Maximum potency rating	2.63	2.77
Nfinimum activity rating	-2.48	-2.48
Average activity	0.16	0.19
Maximum activity rating	2.63	2.63

Table 3: Unique Affective Response -Us-ed for Both

	Used only for Hurricane Hugo	Used only for Loma Prieta Earthquake	
Number of distinct base words	140	45	236
Average evaluation (male)	-0.41	0.01	0.30
Average potency (male)	-0.43	0.52	0.73
Average activity (male)	0.33	0.35	0.27
Average evaluation (female)	-0.38	0.04	0.76
Average potency (female)	0.40	0.54	0.76
Average activity (female)	0.35	0.38	0.30

Table 4: Avemge Affective Response by Crisis

	Hurricane1ju Igo		Loma Pzieta Earthquake	
Average number of distinct base words per text	TOP 52.61	Middle 34.16	TOP 38.44	Middle 38.87
Average number of times each base word used per text	2.97	2.31	2.62	2.63
Minimum evaluation rating	-3.05	-3.80	-2.21	-3.05
Average evaluation rating	0.59	0.68	0.74	0.77
Maximum evaluation rating	2.88	2.88	2.49	2.77
Minimum potency rating	-2.52	-2.52	-2.52	-2.52
Average potency rating	0.87	0.83	0.91	0.86
Maximum potency rating	2.24	2.63	2.77	2.77
Minimum activity rating	-2.48	-2.48	-2.48	-1.49
Average activity	0.17	0.16	0.16	0.21

Table 5: Director's Response

	Hurricane Hugo	Loma Prieta Earthquake
Number of distinct base words per text	178	103
Average number of times each base word used per text	5.11	3.37
Minimum evaluation rating	-2.91	-2.91
Average evaluation rating	.58	.53
Maximum evaluation rating	2.56	2.77
Minimum potency rating	-2.52	-1.81
Average potency rating	.83	.80
Maximum potency rating	2.31	2.77
Minimum activity rating	-2.48	-2.48
Average activity	.16	.18
Maximum activity rating	2.63	2.63

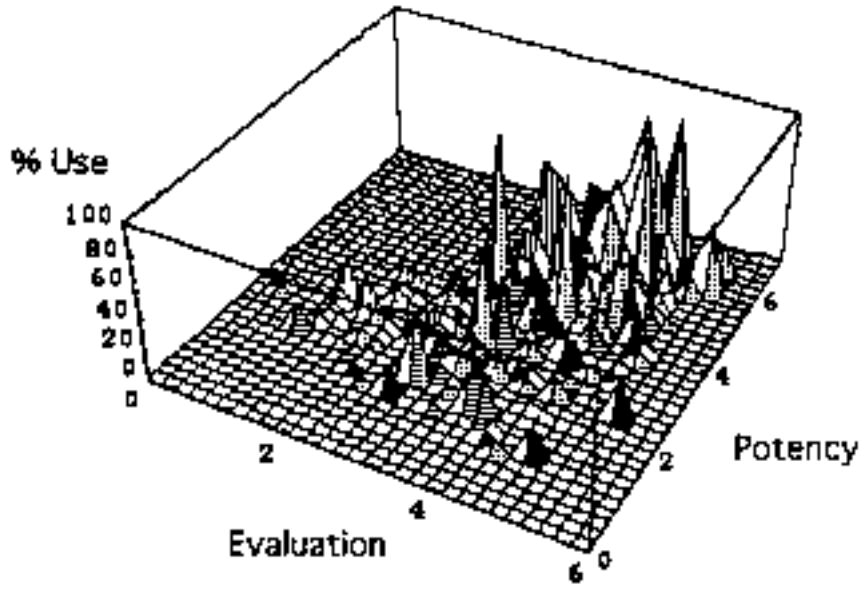

Figure 1. Distribution of Usage in Hurricane Hugo Reports

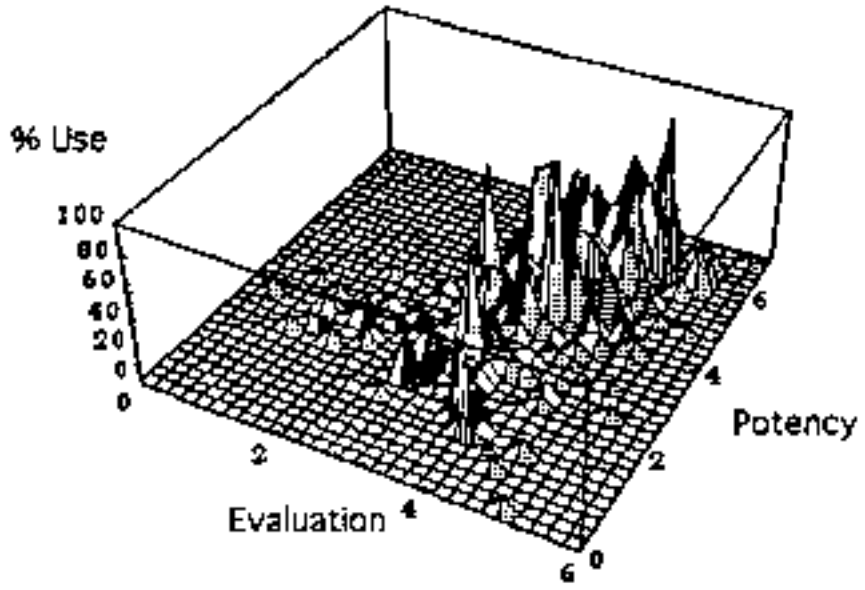

Figure 2. Distribution of Usage in the Loma Prieta Earthquake Reports

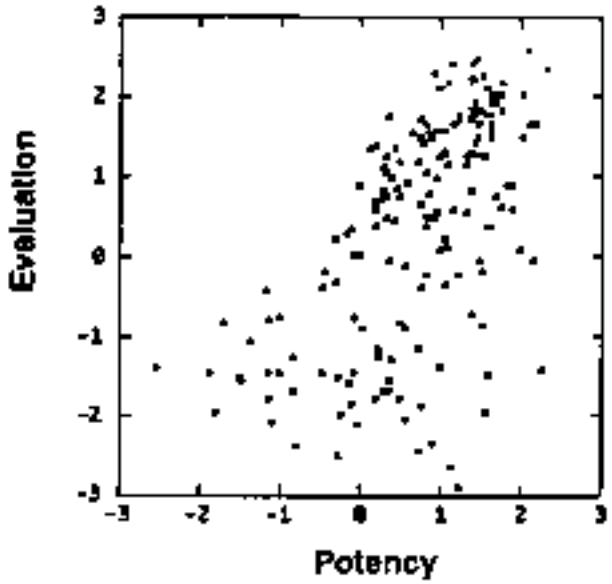

Figure 3. Distribution of response for director of Hugo response on evaluation and potency.

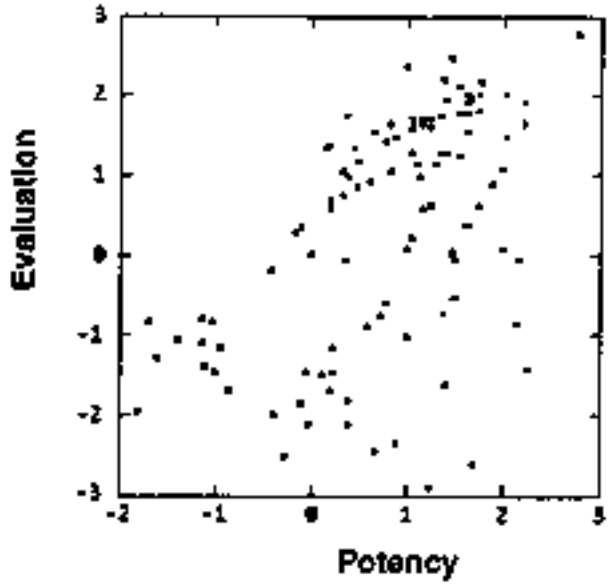

Figure 4. Distribution of response for director of Loma Prieta response on evaluation and potency.

note figure 3 used me2 and mp2 as male director

figure 4 used we2 and wp2 as fernale director