THE ROLE OF TRUST IN COMMUNICATION BREAKDOWNS IN DISASTER SITUATIONS

by

Robert M. Scholander
BA (Hons), SFU 2001

THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

In the
School
of
Communication

SIMON FRASER UNIVERSITY

Summer 2008

SIMON FRASER UNIVERSITY

PARTIAL COPYRIGHT LICENCE

I hereby grant to Simon Fraser University the right to lend my thesis, project or extended essay (the title of which is shown below) to users of the Simon Fraser University Library, and to make partial or single copies only for such users or in response to a request from the library of any other university, or other educational institution, on its own behalf or for one of its users.

I further grant permission to Simon Fraser University to keep or make a digital copy for use in its circulating collection.

I further agree that permission for multiple copying of this work for scholarly purposes may be granted by me or the Dean of Graduate Studies. It is understood that copying, publication or public performance of this work for financial gain shall not be allowed without my written permission.

☐ **Public performance permitted:**
Multimedia materials that form part of this work are hereby licenced to Simon Fraser University for educational, non-theatrical public performance use only. This licence permits single copies to be made for libraries as for print material with this same limitation of use.

☐ **Public performance not permitted:**
Multimedia materials that form part of this work are hereby licenced to Simon Fraser University for private scholarly purposes only, and may not be used for any form of public performance. This licence permits single copies to be made for libraries as for print material with this same limitation of use.

☑ **Multimedia licence not applicable to this work.**
No separate DVD or DC-ROM material is included in this work.

Title of Project:

The Role Of Trust in Communication breakdowns in Disaster situations

Author: _____
Robert M. Scholander

_____
(Date Signed)

SIMON FRASER UNIVERSITY

PARTIAL COPYRIGHT LICENCE

Simon Fraser University

Ethics Approval

The author, whose name appears on the title page of this work, has obtained human research ethics approval from the Simon Fraser University Office of Research Ethics for the research described in this work, or has conducted the research as a member of a project or course approved by the Ethics Office.

A copy of the approval letter has been filed at the Theses Office of the University Library at the time of submission of this thesis or project.

The original application for ethics approval and letter of approval is filed with the Office of Research Ethics. Inquiries may be directed to that Office.

Bennett Library
Simon Fraser University
Burnaby, BC, Canada

APPROVAL

Name: **Robert M. Scholander**

Degree: **Master Of Arts**

Title of Thesis: **The Role Of Trust In Communication Breakdowns In Disaster Situations**

Examining Committee:

Chair: **Prof. Gary McCarron**
Professor, School Of Communication, SFU

_____

Prof. Peter Anderson
Senior Supervisor
School Of Communication, SFU

_____

Prof. Richard Smith
Supervisor
School Of Communication, SFU

_____

Title and Name
[Internal/External] Examiner
[Associate/Assistant] Professor of/Department of???
University (if other than SFU)

Date Defended/Approved: _____

ABSTRACT

Disaster situations are, by their very nature, broad and complex situations. While it is intrinsically appealing to assume that communication breakdowns in these situations are due to technological barriers, this assumption overlooks the possibility that non-technological barriers to communication exist within and between agencies and individuals. High levels of social capital within or between groups will enable better communication and resource flows. Thus trust will clearly have a critical role in communication during disaster situations. This thesis describes the disaster communication and seeks to understand the role of trust in the communication process. The literature reviewed here explores the areas of communication breakdowns and interoperability, gathering together diverse literature regarding the role of social networks, habitus, and trust in order to understand better the dynamics of the communication process in disaster situations.

DEDICATION

To my wife Skye — my inspiration.

ACKNOWLEDGMENTS

I would like to thank Peter Anderson and Richard Smith for all of their advice and support over the years. I would also like to thank Adam Holbrook from the Centre for Policy Research on Science and Technology for the countless hours of tossing around ideas, and for the numerous opportunities given to me in the process.

I would also like to thank my wonderful parents Brenda and Erik for their love and support over the years.

TABLE OF CONTENTS

LIST OF FIGURES

GLOSSARY

BCERMS – (The British Columbia Emergency Response Management System) The emergency response management system implemented by the Provincial Emergency Program based on the Incident Command System.

Communication – the message related components of the communication process.

Communications – refers to the technological components of the communication process – the medium.

EOC (Emergency Operations Centre) – The EOC is responsible for the strategic, or "big picture" of the disaster, and does not normally directly control field assets, but makes strategic decisions and leaves tactical decisions to lower commands. The common functions of all EOC's is to collect, gather and analyze data; make decisions that protect life and property, maintain continuity of the government or corporation, within the scope of applicable laws, and to disseminate those decisions to all concerned agencies and individuals.

Habitus – Habitus is a complex concept referring primarily to the nondiscursive aspects of culture that bind individuals to larger groups, such as gender, race, culture, community, emotional state, religion, language, and psychological state. (Bourdieu and Wacquant, 1992).

ICS (Incident Command System) – ICS is a management system used to organize emergency response. ICS offers a scalable response to an emergency (incident) of any magnitude, and provides a common framework within which people can work together.

Interface Fires – Interface fires occur when forest fires encroach upon humans and human infrastructure.

Inter-agency communication – The communication that occurs between two or more agencies.

Intra-agency communication – The communication that occurs within an agency.

CHAPTER 1: INTRODUCTION

Effective communication is essential in any situation where people need to work together to solve problems; communication breakdowns can significantly impair this process. Disaster situations are particularly susceptible to communication breakdowns because they usually require the coordination of resources of diverse individuals and groups. Virtually every post-disaster event study and public enquiry has highlighted the special role that inter-organizational communication plays during crucial disaster response operations. The Hurricane Katrina Independent Panel, for example, found that during the hurricane "…In the hardest hit areas…the disruption of public safety communications operability, as well as a lack of interoperability, frustrated the response effort and caused tremendous confusion among official personnel and the general public" (2006, p. ii). Since the costs of breakdowns in these situations can be enormous, potentially involving the loss of property and even lives, it is critically important to understand better the process of communication in these specific contexts.

The consequences of a failure to achieve communication interoperability or of a breakdown in communication interoperability during disasters can be catastrophic. As Captain Dave Lopez of the L.A. County fire fighters stated after the 2003 fire season, one of the most damaging fire seasons in California history:

> We are the ones that go out there and put the fires out. We are the ones that risk our lives out there. All I can say is that, without proper communications, I'm surprised we didn't lose more bodies than

> what we did, and I ask that the Commission look into the communication problems because there's nothing more frustrating to a company officer than, when you engage in a fire, and you have communication problems. (Governor's Blue Ribbon Fire Commission, p. 89)

After the California fires in 2003 "there were 24 fatalities (one firefighter), 246 injuries, 3,631 structures destroyed… the damage estimate is over 2 billion dollars and required 15,631 personnel, including firefighters, law enforcement, administrative support and management staff, to assist with fire suppression efforts" (p. E-1). Despite the importance of communication among first responders exemplified above, achieving effective interoperability among organizational communication networks remains elusive in most jurisdictions. This reality was emphasized by The National Commission on Terrorist Attacks upon the United States (NCTAUS) after the September 11, 2001 attacks on the World Trade Center:

> The inability to communicate was a critical element at the World Trade Center, Pentagon, and Somerset County, Pennsylvania, crash sites, where multiple agencies and multiple jurisdictions responded. The occurrence of this problem at three very different sites is strong evidence that compatible and adequate communications among public safety organizations at the local, state, and federal levels remains an important problem. (2004, p. 397)

Even with the multitude of communication breakdowns that became apparent after this event, the emergency management community is still subject to strains on its communication capacity, as evidenced by the 343 fire fighters, 23 NYPD police officers, and 37 Port Authority police officers that lost their lives[1] (NYMAG, 2007). "The PAPD [Port Authority Police Department] lacked written standard

[1] Not all of these lives that were lost were necessarily lost due to communication breakdowns.

operating procedures for personnel responding from outside commands to the WTC during a major incident. In addition, officers from some PAPD commands lacked interoperable radio frequencies" (292). After several years of increased focus on and funding to improve communication between first responders and response agencies, communication breakdowns continue to be a problem. Four years after the World Trade Center attack, during Hurricane Katrina, communication networks sustained tremendous damage which significantly complicated response and recovery operations:

> Hurricane Katrina and its aftermath had a devastating impact on communications networks in the Gulf Coast region. In the affected areas of Louisiana, Mississippi and Alabama, more than three million customer telephone lines were knocked out of service. Both switching centers and customer lines sustained damage. Thirty-eight 911 call centers went down. Approximately 100 broadcast stations were unable to transmit and hundreds of thousands of cable customers lost service. (p. 6)

While this example emphasizes the consequences of communication breakdowns for the individuals directly affected by the hurricane, the same factors critically impaired communication among the organizations and individuals responding to the situation. "The Panel heard evidence that, in many cases, responders in different agencies were unable to communicate due to incompatible frequency assignments" (p.25). These incidents of incompatible frequency assignments and physical devastation of critical communication infrastructure or breakdowns in communication conduits highlight the critical role of communications in disaster situations and suggest that it is imperative that interoperability issues be resolved or at least considered in a more complete and

systematic way in order to improve the resiliency of emergency communication networks.

Traditionally, post-disaster studies of communication breakdowns have largely focused on the role of technological barriers to communication interoperability. Approaching communication breakdowns from this limited perspective can be problematic. Technological 'interoperability' is a real issue but, in the communication process, interoperability, or lack of interoperability, can occur due to a host of other non-technological variables. It is the differences in social milieu of culture, personality, language, and other components that creates a tremendous potential for communication breakdowns. Though it is common to regard technological barriers to communication as primary, these technological barriers may themselves be produced in part by social factors that are often unexamined. Thus, this thesis attempts to explore the following questions: (1) What is the nature of communication breakdown in disaster situations? and (2) What are some of the socio-cultural factors that contribute to these breakdowns?

This thesis will demonstrate that in the course of trying to understand the problem of communication breakdowns in disaster situations, most studies and post-event enquiries have focused on a narrow examination of the technological means of inter-organizational communication rather than taking a more holistic approach that would encompass both technological and human/social factors. Human/social factors include, but are not limited to, language (including privileged discourse), culture (including organizational culture), personality, and other non-discursive elements of an individual or group. These human/social

components are extremely important since, in the communication process, they are as likely to influence its success or failure as the technological medium. Therefore, the absence of applying a broader definition of interoperability impedes effective resolution of these problems and mitigation of consequences.

This thesis is an exploration or pilot study into issues of communication interoperability among emergency response organizations through a review of four post-event public enquiries and studies. Traditional definitions of interoperability will be introduced, discussed, and analyzed with a view to establishing the contextual parameters and implications for resolving interoperability problems. The thesis will then present an expanded definition of interoperability and introduce and define several other concepts such as a model of communication based on the work of Yates (2007), the concept of habitus by Bourdieu and Wacquant (1992), and the concept of trust (Fox, 1974). This definition will provide a framework to better conceptualize the communication process in the specific context of a disaster.

In order to understand better the sources of communication breakdowns in disaster situations, it is necessary to look beyond the limited definition of interoperability from a mainly technological perspective and consider the influence of social issues on interoperability. In order to do this, Chapter 2 introduces basic concepts of interoperability through a review and analysis of key literature sources. These sources include documents developed by various agencies such as: Cisco Systems, RBP Associates and the Public Safety Wireless Network Program. The chapter also sets out other key definitions,

provides information about the context of the emergency management community, and provides a methodological basis for this thesis. The information in Chapter 2 will provide a context for the discussion of communication breakdowns which follows in subsequent chapters.

Chapter 3 focuses on the theory and literature regarding several social variables that are relevant to communication breakdowns in disaster situations, including social networks, habitus, and trust. These concepts will be considered with reference to their role in influencing the communication process in several specific disaster situations through an examination of relevant post-disaster documents.

Chapter 4 draws together theory and practice through a review of several key post-disaster event enquiry documents as case studies including:

- *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks Upon the United States* (911 Report) (NCTAUS, 2004)
- *The National Inquiry on Bushfire Mitigation and Management* (Australian Bush Fires Report) (Ellis, S., Kanowski, P., and Whelan, R. 2004)
- *The Governor's Blue Ribbon Fire Commission Report* (California Fire Report) (Governor's Blue Ribbon Fire Commission, 2004)
- *Firestorm 2003: Provincial Review* (Firestorm Report). (Filmon, 2004)

A central finding that emerges from examination of these documents is that post-disaster reports emphasize the role of the medium of communication (technological variables) in contributing to communication breakdowns, at the expense of considering the role of human aspects (social variables) in such situations. Although the document analysis included in this thesis is important, the theoretical exploration of the thesis is the primary focus.

Chapter 5 proposes that the concept of interoperability be expanded to include both technological and social variables. In expanding the definition in this way, and then addressing some of these social variables in the emergency management community, it may be possible to find new ways to increase interoperability and thereby reduce breakdowns in communication during disaster situations. Finally, I conclude with some proposed directions for future research in this area.

CHAPTER 2: CONCEPTS, CONTEXT, AND METHODOLOGY

In order to understand better the problem of communication breakdowns in disaster situations it is first necessary to establish a framework which can be used to position the discussion. The framework that will guide the discussion in this thesis is, by necessity, based on a chain of assumptions. Because of the context complexity of disaster situations, the assumptions underlying this discussion will bring together and be guided by current literature from several different areas of study including sociology, industrial organization, social capital and network theory.

The chain of assumptions begins with the postulate that communication breakdowns occur because of a lack of interoperability. That is, there is an inability to successfully communicate a message or idea from one party to another. A loss or a lack of interoperability can result from technological failure, but can also be due to social and cultural variables. Generally the influence of social and cultural variables on interoperability in disaster situations has been overlooked because the technological failure is often a more immediately obvious contributor to communication breakdowns. One key social variable affecting interoperability is *habitus*.[2] Shared habitus can generate trust, which in turn,

[2] Habitus is a complex concept referring primarily to the non-discursive aspects of culture that bind individuals to larger groups. The concept of habitus will be explored in greater depth in Chapter Three.

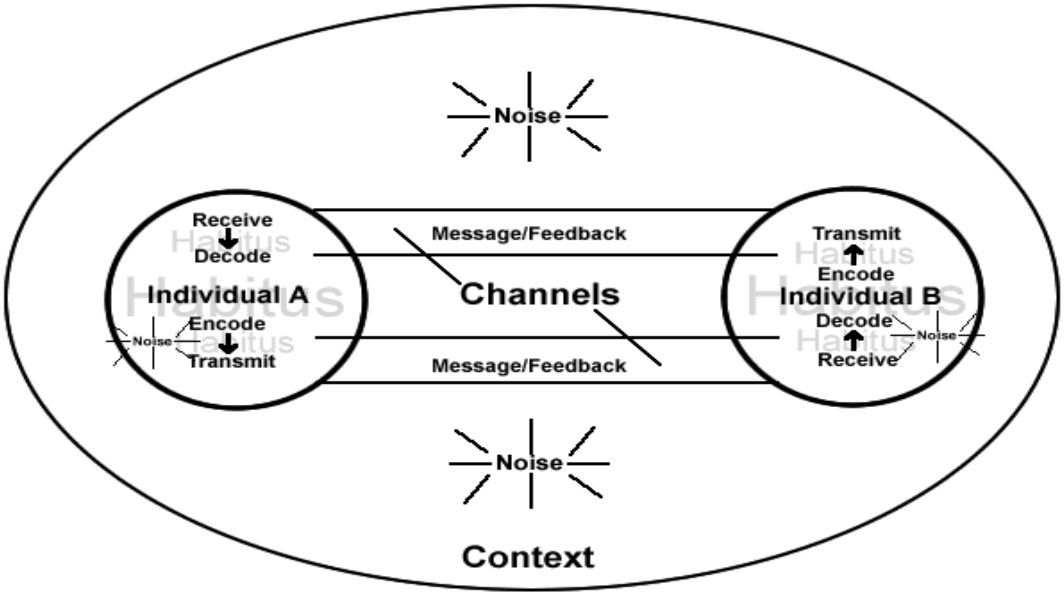
mitigates the noise or interference that can lead to a loss of interoperability. Commonality in habitus between individuals can be the building blocks through which trust develops. The dynamic interplay between trust and commonality can help mitigate potential communication breakdowns that can occur from a lack of shared meaning. This chain of thought assumes that our uniqueness as individuals and the diversity of our beliefs, thoughts, and ideologies adds to the complexity in our communicative relationships. These components may affect any communication in a positive or negative way. This notion is particularly relevant in high-stress situations such as disasters, because stress can amplify the complexity of the social dynamics. The next link in this chain supposes that the development of trust can overcome many of the social barriers to communication caused by incompatible components of habitus or the lack of common habitus. By increasing levels of trust between communicators they are better able to either overcome barriers due to incompatible aspects of habitus, and they are also more apt to search out aspects of habitus that are compatible. This process is not much different than at a dinner party when two people meet and begin exchanging information in order to establish a potential connection to one another, e.g., “So what do you do for a living? Have you seen this movie? Do you know Tom or Janet?” The more trust that a person feels towards another person during an initial meeting such as in the example above the more likely they are to pursue these lines of questioning. The greater the levels of trust, the more in-depth the questions will likely become.

The Communication Process

One of the first problems in dissecting any communication issue is to define what the term ‘communication’ means. Complicating any document analysis of communication in disaster situations is the fact that the terms ‘communication’ and ’communications’ have been used with such varied meaning that they cease to hold common meaning. It is important, however, to acknowledge and articulate some of these various meanings. In this thesis, all issues referred to as “communication issues” or “communications issues” will be framed using a simple McLuhan-esque typology. Those issues involving the term ‘communication’ will be identified as being related to the message, while ‘communications’ will refer to the medium (McLuhan, 1964).

For the purpose of this thesis, I will use a model described by Yates (2007; Figure 1) which is an expansion of the Shannon Weaver Model of communication (Shannon, 1949). In Yates’ expanded model, communication can be understood as a dynamic process comprising a system of components that can be analyzed individually. This process will be affected by the individual’s or group’s habitus which is the aggregate of all the non-discursive elements of the individual or group; these may include, but are not limited to, gender, race, culture, emotional state, religion, language, and psychological state (Bourdieu and Wacquant, 1992).

Figure 1: The Communication Process.



It is also important to recognize that communication occurs within a context. This context includes such factors as "The *physical setting*, the *relationship* details, the *culture* within which an exchange takes place [and] the particular *situation*" (Yates, 2007). Each of these factors will have an impact on the interpretation of a message.

Yates further explains that, in his proposed model of communication, individuals are typically both senders and receivers (2007). Messages between the individuals must then be submitted through a channel, a concept which "…can refer to a vehicle for sensory perception like a sound or light waves, or… to the medium through which the message is delivered like TV, Radio, Magazines, etc." (Yates, 2007). However, before a message can be transmitted, the idea or feeling must be encoded into a common set of shared symbols. Yates explains that "Communicators must share common symbols for effective communication to take place," but also cautions that "Messages are [t]ransmitted

verbally and non-verbally." As a result, many factors other than the symbols themselves will have an impact on the effectiveness of the message. "Articulation, diction, pronunciation, as well as tone of voice, rate and volume" (Yates, 2007) all play a role in the success of the communication. As Stewart Hall articulates, "we must recognize that the discursive form of the message has a privileged position in the communicative exchange (from the viewpoint of circulation), and that the moments of 'encoding' and 'decoding', though only 'relatively autonomous' in the communicative process as a whole, are determinate moments."(Hall, 2006, p.167)

Once the message has been received it must then be decoded from the transmitted symbols into meaning in the receiver's head. The sender then receives feedback that the message was received. Noise can be considered, in a very broad sense, as any impediment to the message. Noise can be internal, like a wandering mind during a conversation; external, like environmental distractions, such as crowds of people in the background talking; or semantic, like distortion or misunderstanding that occurs because of a problem in the shared symbols or language transmitted (Yates, 2007).

Communication breakdowns occur when two parties are unable to communicate or when communication is impacted or altered by noise somewhere in the communication cycle. These breakdowns can occur for many different reasons, including differences in language, culture, ethnicity, or a host of other non-discursive components of an individual or group. This situation may manifest itself in obvious ways, such as an instance where two individuals are

attempting to communicate but speak different languages. The language difference would then be considered as noise in the communication model suggested in this thesis. A far more subtle and common breakdown might be a situation in which two agencies have shared terms or acronyms, but not necessarily shared meaning. An individual in an Emergency Operations Centre might make a logistics request for “power bars” and then be quite surprised when electrical power bars arrive when what they thought they were requesting was food. Clearly, technological failure is only one possible factor leading to noise in the communication process. I believe that understanding the social factors contributing to communication breakdowns is critical. Because of the current trend in post-disaster studies to focus on technological variables as key to communication breakdowns, it is easy to overlook the equally important role of social variables in the communication process. While it is the social dimension of these communication breakdowns that will be the focus of this thesis, it will also be necessary at times to look at the technological issues in order to lend insight to the social issues.

Interoperability

Interoperability has become a buzzword in the emergency response community. Interoperability in communication situations refers to the ability of two different technologies or individuals to operate with one another or successfully communicate. Traditionally, definitions of interoperability have focused on the technological variables that facilitate or impede effective communication. For instance, the Public Safety Wireless Network Program (PSWN) defines

interoperability as the "…ability of public safety personnel to communicate by radio with staff from other agencies" (1999, p. 1). Further, in a report contracted by Industry Canada, RBP Associates defined interoperability as the "…ability of public safety agencies to talk to one another via radio systems — to exchange voice and/or data with one another on demand, in real time, when needed" (2003, p, i). However as we can see from the communication model outlined by Yates (2007), many factors, both technological and human, influence communication interoperability in disaster situations. Therefore, any discussion of communication breakdowns needs to consider both technological and social variables. Thus, in examining interoperability in disaster situations we must be concerned both with the ability for different technologies and for different people to operate/communicate with one another.

The Emergency Management Response Context in British Columbia

In addition to the tremendous social and technological complexities that have an impact on communication in the emergency management community, there are also many structural, legal, political, and organisational variables that make effective communication more challenging. The emergency management context in Canada is a large and complex one which involves all parties including individuals, private corporations, community organizations; and municipal, provincial, and federal governments (see Figure 2). These various stakeholders need to work together to plan for and respond to disaster situations.

The response to an emergency situation depends on many variables including its scope, location, first responder, and the nature of the emergency. Individuals are expected to plan for and respond to everyday emergencies such as sickness, but when the emergency escalates beyond the individual's capacity to respond (e.g., fire, hazardous materials spill, or civic unrest) then the local authorities may be contacted for assistance.

Figure 2: Emergency Management Response Process In British Columbia

If local resources required to respond to an event are exceeded, the local government may turn to the provincial government for assistance. The provincial government will typically support the first response agency that has taken the lead in the event. For example, if there is a large-scale fire in downtown Vancouver and the City of Vancouver lacks the resources necessary to effectively respond, then the province will support the city by accessing more resources, but they will not take over the leadership of the response. Similarly, if the provincial government's resources are exceeded then the federal government will provide additional resources upon request from the provincial government.

There is a great deal of variety in situation and circumstance and as a result, the leadership in a response may not always follow this typical response structure. For instance, there are certain cases where multiple jurisdictions come together and leadership is shared (i.e., shared command). During a forest fire the lead in British Columbia is the provincial Forest Service. However, when that fire encroaches upon a community — where the lead is local authority— the Forest Service and the Office of the Fire Commissioner are in a position of shared command. Another example where process doesn't necessarily follow the structure as outlined occurs when the incident involves property owned or managed by federal or provincial agencies. For example, federal prisons are in local jurisdictions, but since they are federally-operated institutions, any emergency situation would fall under a federal lead. Typically, command-and-control protocols are already established between most of the relevant parties so that in the event of an emergency or disaster, resources can be shared under the appropriate authority. The effect of all of these potential variations in response structure is in adding additional levels of complexity to the communication process in disaster situations.

There are many additional factors that influence the dynamics of the interactions within the emergency response community. One factor is that the agencies involved in a disaster response may be in direct competition with each other for limited government funding or resources. This competition can create an environment of defensiveness and political pandering among agencies and/or officials. The result of this type of environment might include various forms of

intransigent behaviour, such as not sharing critical information. During an emergency situation, withholding critical information could mean the difference between life and death; These are, of course, descriptions of the worst possibilities; there are, in fact, abundant cases where individuals and groups are working hard to move beyond this ‘culture of the *mine*’.

The recent advanced planning unit for the anticipated 2007 spring freshet in the Lower Mainland of British Columbia provides examples of some of the positive and negative aspects of the interactions in emergency situations. The provincial government brought together a team of experts from various stakeholder groups at all three government levels. At the local level, this included police, ambulance, and First Nations communities. At the provincial level, stakeholders included at least six ministries: Ministry of Transportation, Ministry of Health, Ministry of Agriculture and Lands, Ministry of Environment, Ministry of the Solicitor General, and Ministry of Forests. Finally, at the federal level, experts came from Public Safety and Emergency Preparedness Canada, Department of National Defence, Department of Fisheries and Oceans, Department of Corrections, Indian and Northern Affairs Canada, and Transport Canada. There were also experts from private industry and academia. This planning unit provided a unique opportunity for stakeholders to come together in preparation for a major emergency. And, while there was a tremendous level of camaraderie among most participants, there were also a number of challenges in sharing information due to legal and organisational constraints. These issues are considered within this discussion only to highlight that the diversity of

stakeholders and responders involved in a disaster situation brings with it an equal diversity of interests, goals, and perceptions that affect how the various parties interact, and thus communicate, with one another.

Within the different levels of the emergency management community, an additional level of complexity arises from the many levels of legislation that guide the emergency response process. These include the BC Local Authority Emergency Management Regulation (BCLAEMR), the British Columbia Emergency Response Management System (BCERMS), and the Incident Command System (ICS). The BCLAEMR dictates the municipal and provincial level of response to emergency or disaster situations in British Columbia. There are similar guidelines that have been developed for every level of the emergency response process from local municipal governments all the way up to the federal government. At all levels of government, individuals and agencies are responsible for creating and implementing emergency plans outlining the appropriate response to various emergency situations.

In British Columbia, emergency managers within the provincial public sector adhere to a set of procedures outlined in BCERMS. BCERMS is a process and a set of procedures for organising and managing the response to a disaster situation. BCERMS is based on the Incident Command System (ICS), which was developed to organize multi-agency/multi-jurisdictional responses. Emergency management in British Columbia is designed as a set of responses for public sector responders to help communities. This means that the implementation of the ICS system is of tremendous benefit to responders within public agencies;

however, many of the stakeholders involved in responding to disaster situations are not public entities. Private firms, insurance, telephone, or utility companies and numerous community-based organizations, such as church groups, clubs, and schools, also have a role in emergency management, and as such, need to have their own emergency plans. In addition, cellular phone companies, television and radio broadcasters, and internet service providers are critical to disaster planning, response, and recovery. While it is necessary for the federal, provincial, and local governments to have emergency plans in place there are clearly many more stakeholders than just these three levels of government. In order to develop effective emergency response plans, it is necessary for all stakeholders to engage in the planning process and, moreover, to communicate the results of this process to the other stakeholders.

The emergency management situation is further complicated by the fact that stakeholders in an emergency response may have a very different interpretation of what a response should look like. This complexity may occur because one group may have a different set of goals and responsibilities than another group. For instance, due to deregulation and privatization, much of the infrastructure that is relied upon for emergency response is now controlled by private sector firms who may prioritize shareholders' interests. For example, all levels of government, with the exception of some emergency services, purchase their communication services from private companies, often with little or no provision for quality of service or guarantee of service. As a result, any emergency communication that uses private networks may or may not be

available in times of need. In addition, while many of these entities have disaster plans and response strategies in place, not all groups have coordinated these strategies. Furthermore, because of differences in the resources available to public versus private organizations, the stakeholders in a disaster situation all do not have the same access to the same resources to follow procedures. For example, one private organization may have a well-developed emergency plan, but it may not be cohesive with the plan adhered to by the provincial government or local public entities. Thus, the effectiveness of communication before, during, and after a disaster response will also be affected by an organization's access to resources within its own emergency planning process.

Unfortunately, the overall disaster response organization is far too complex simply to implement a system and expect the system to solve all of the problems. Although BCERMS was mandated within the public sector in British Columbia in 1998, almost a decade later it is still not understood or interpreted the same way by all public agencies or individuals. Despite attempts to try to alleviate these problems organizationally through systemic changes, such changes in and of themselves are not enough to assure effective communication between stakeholders. What is important to recognize is that there are a great many more stakeholders in a community than those actively engaged in emergency management and that the process needs to consider both public and private sector groups. The sheer volume and diversity of these stakeholders creates a complex communication structure which cannot be mitigated by

legislation alone. Only through common goals and open discourse can the emergency management community begin to navigate this complexity.

Methodology

Overview

Although this thesis may discuss broader conceptual issues, it is primarily interested in the functional aspects of communication in disaster situations. More specifically, this study is concerned with the applied nature of communication in these situations — the identification of problems or barriers to communication and the proposal of solutions. Thus, the research questions that this thesis proposed to explore were: (1) What are the nature of communication breakdowns in disaster situations? And (2) What are the contributing socio-cultural factors to these breakdowns?

However, the preceding overview of how the communication process works within the structure of the emergency management community in British Columbia highlights a few of the variables that make studying interoperability in a disaster context such a complex task. This complexity arises from both the intricacies of the communication process, and the number and diversity of stakeholders involved. Although I have spent time in the emergency management community, I realized that I had neither the ability nor the experience in the field to describe the context effectively. For this reason, I chose to use existing studies of specific disaster responses to guide my exploration. To do this, I first allowed the context, as it is revealed in three post-event enquiry

documents, to identify the specific communication issues to be explored. Thus, any knowledge claims will be in the tradition of the pragmatist where “knowledge claims arise out of actions, situations and consequences rather than antecedent conditions (as in post-positivism)” (Creswell, 2003, p. 11).

This review of the post-disaster reports then served to provide the foundation from which my central hypothesis emerged. My hypothesis is that although the post-disaster documents emphasized the role of technological interoperability in communication breakdowns in disaster situations, social/cultural factors also impact interoperability in these situations but are chronically under-represented in the documents. I then performed an analysis of the Firestorm 2003 transcripts. These documents constitute the raw data that were used to generate the Firestorm 2003 report. I then used the report to evaluate the hypothesis suggested by the transcripts. Further, in the process of conducting this analysis it became apparent that the Firestorm 2003 report might not accurately reflect the raw data in the transcripts in terms of the relative importance placed on social-cultural barriers to communication versus technological barriers. The most significant consequences of the report’s emphasis on technological instead of social-cultural interoperability in disaster situations was that the recommendations of the report reflected this emphasis by suggesting mainly technologically-based solutions to the issues that were raised. This emphasis, in turn, might additionally result in neglecting to develop solutions to address communications problems arising from the equally important human variables.

Analysis

The study was conducted in three phases. In the first phase, literature in the areas of social networks, social capital, habitus, and trust was reviewed to provide the background for understanding the human/social factors that might affect communication in disaster situations. The relevant literature will be discussed in detail in Chapter 3. This body of literature was then amalgamated into a loose framework that was used to guide the other two phases of the study. In order to carry out the second phase of the study a simple binary typology was derived, differentiating the use of the terms ‘communication’ and ‘communications’. This typology was used to explore in more detail communication issues in disaster situations. In order to determine if each communication issue was related to the medium (communications) or the message (communication), the documents were analyzed for these keywords: communication and communications.

The second phase of the study was an analysis of three post-disaster reports: the 911 Report, the California Fire Report, and the Australian Bush Fires Report. The documents were first analyzed through key word identification using the binary typology described above. This was done by first identifying each instance of the term ‘communication’ or ‘communications’ and then determining whether these terms were being applied in the way consistent with this typology. For instance, if the term ‘communication’ was used to identify a technology this would have been identified as an inconsistent usage according to the typology. The post-disaster reports were then further reviewed by assessing the key words

in context to understand better the context of the reference to communication or communications issues (i.e., whether each communication issue being raised was technologically or socially based). This inductive approach was employed to "…understand the points of view of actors in the setting, identify worthy research questions …and allow theory to emerge" (Palys, 1997, p. 79).

The process of examining the adherence of the post-disaster reports to a consistent typology in describing the communication issues that occurred is useful for a number of reasons. First, it allows for the identification of not only the number of occurrences of these issues in the documents. Second, it also allows for the identification of other potential issues around communication. The purpose of looking at the post-disaster documents in this way was to identify instances of communication breakdowns in specific disaster situations and, by doing so, to develop a testable hypothesis.

Additionally, in this second phase of the study, the typology developed in the literature review phase of this study was applied. This process helped to identify the areas where the typology was inadequate to differentiate communication issues related to the medium from those related to the message. Upon conducting the keyword analysis of the post-disaster documents, it became clear that the terminology used in compiling the reports was not accurate in representing the actual proportion of communication issues versus communications issues. At this point, an additional analysis was performed using the typology in order to examine in more detail the context of the terminology. In

this way, rather than just simply identifying the number of times the terms were used, I was able to consider how each term was used.

The third phase of this study was an additional pilot study which consisted of an analysis of another post-disaster document, the Firestorm 2003 Report, and a comparison between this report and the transcripts from which it was derived. This additional pilot study served two purposes: the first was allowing me to perform a standard analysis using the binary typology including context described above; the second was providing the ability to perform a direct comparison between the primary source — the transcripts — and the secondary source — the report that was derived from the transcripts. The analysis was then extended to determine if the number of issues of communication breakdowns within the report were proportionate to the number of instances identified in the transcripts. During this process I looked at each instance of the term 'communication' and 'communications' in the transcripts and identified whether the usage of the term was intended to be in reference to either the medium or the message. This was done by assessing each occurrence in the context of its origin and attempting to identify the intent of the originator; for instance, was the originator referring to the medium or the message? I then determined the proportion of the use of one term relative to the other. This process was intended to verify the degree to which the Firestorm 2003 Report accurately reflected the number and types of communication breakdowns recorded in the transcripts[3]. Furthermore, the transcripts from this report were explored in order to consider

[3] As all of the coding and analysis was performed by myself, the results are potentially biased since it lacked Inter-rater/ coder reliability.

other issues, with respect to communication, that the participants thought were of consequence. These issues help to provide context for the discussion and recommendations in Chapter 5.

Summary

Emergency management, like any form of management, is a complex structure of responsibilities. The ability to communicate through the various government departments and levels, as well as to communicate with the appropriate responders to a situation, is essential to managing these responsibilities. While the technological component of communication is critical during a time of emergency or disaster, for the purposes of mitigating emergencies or disasters, human relationships are at least as essential. It is human beings who are responsible for making immediate decisions in high-stress contexts and who need to share information with one another in order to aid in the decision-making process. This thesis considers the possibility that the technologies that are used in these situations are peripheral to the communicators themselves. In order to explore this possibility, it is important to understand better some of the factors underlying communication breakdowns. This was achieved by reviewing a number of literature sources in combination with grounded research that utilizes several post-disaster reports.

CHAPTER 3: THEORY AND LITERATURE

There are a number of theoretical and literary paths one may choose for understanding any given issue. At times the decision to take one path over another is simply a matter of chance and opportunity. The path chosen for this literature is, to some degree, a factor of both. Owing to the fact the material that is described here was central to the way in which I framed the issues, this experience is reflected in the subsequent choice of literature that frames the argument in this thesis. The trajectory of the literature begins by explaining the human communication process and the potential “noise” that can impede successful communication between individuals or groups. In addition, it explores research with respect to some of the human variables that impact on communication, including habitus and trust. By exploring these integral components of individuals, we can better understand how these components can facilitate or impede successful communication. Furthermore, this chapter explores theories of trust and, in particular, examines how trust can function as a way to strengthen communication within social networks.

The analysis was done through the review of several key post-disaster reports and the identification of issues that were directly or indirectly related to breakdowns in communication, whether these breakdowns were attributed to technological problems or to problems resulting from human/social variables. The

initial documents were analyzed by first attempting to form two different groups of communication issues:

- Communication breakdowns due to technological failure.
- Communication barriers between individuals or groups due to social or cultural barriers.

This process of reviewing the post-disaster reports identifies not only the number of occurrences of these issues in the documents, but it also helps to uncover other issues that may potentially be related to the process of communication.

The second phase of this thesis examined the social and cultural issues identified in the referenced documents through a selection of literature from the areas of social networks and trust. This literature was used as a guide to analyze the other post-disaster documents as well as the primary and secondary documents (Firestorm 2003, and the transcripts from the public hearings), that are discussed in Chapter 4.

The next stage of analysis extends into a pilot study that includes the Firestorm 2003 Report and the transcripts from the public hearings that were the building blocks for the report. The first part of the analysis is undertaken to determine if the number of issues of communication breakdowns within the report were proportionate to the number of instances identified in the transcripts. This was initially done by simply counting the number of occurrences of communication (indicating the message) and communications (indicating the medium). This process is intended to verify the degree to which the final report

reflects the number and types of communication breakdowns recorded in the transcripts.

The next stage of analysis involves looking at each instance of "communication" and "communications" and determining if the usage of the term was intended to be in reference to either the "medium" or the "message." This stage was done by assessing each occurrence in the context of its origin and attempting to identify the intent of the originator (were they referring to the medium or the message?). In addition to these two levels of analysis, I attempted to discern potential communication issues that may be present.

By reviewing the specific post-disaster documents and transcripts through the lens of this body of literature, a new paradigm in communication interoperability has arisen. Typically, communication interoperability has been the domain of engineers and programmers, and has focused almost exclusively on technological interoperability. However, this study highlights the fact that the technology is only one small component of a much larger process in the greater context of communication in disaster situations.

Habitus

One way to conceptualize the diversity and complexity inherent in disaster communication is through the concept of habitus (Bourdieu and Wacquant, 1992). Habitus are the cultural realities that exist in the bodies and minds of individuals; they are the non-discursive elements of a person or group that are the sum of the beliefs, practices, styles, tastes, or habits that are typically

assumed by the person or group. This concept is dynamic and, therefore, subject to the dominance and subordination indicative of human relations. One component of habitus may be more or less important in a given moment than any other component. For instance, in moments of high anxiety an individual's spirituality may exert dominance over his or her intellect whereas in moments of calm the intellect might exert dominance over spirituality. The habitus of an individual is both objective and subjective, but subjectivity is achieved through reflexive critique (Bourdieu and Wacquant, 1992). Only through self-evaluation can an individual obtain awareness of their habitus. However, the habitus of an individual is simultaneously voluntary and involuntary and while it may be subject to reflexive critique it is also grounded in the physical realities of the individual. These components will not likely change without a conscious effort by the individual to understand his own habitus and, as Hall (2001) indicates, it is all of these non-discursive elements of an individual that will inevitably impact the encoding and decoding of the discursive process of communication.

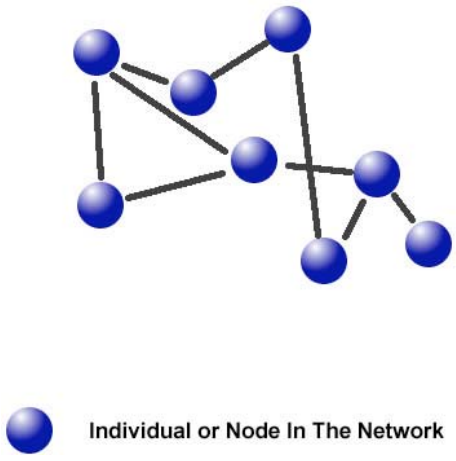
The numerous components of the habitus of an individual impact the social dynamic of the network in which they function. The network may, in turn, influence the habitus of the individuals within it. For example, different agencies may create an environment which is sought out by individuals of particular personality types, perhaps because that personality type suits the career. For instance, police agencies may attract more *type A* personalities than paramedics. And if different agencies attract individuals with differing personality characteristics, these differences may then lead to tension or friction between the

agencies. Any tension or friction in a social network, whether it is within an agency or between agencies, can function as interference or noise in the communicative process (Yates, 2007). This interference causes a lack of interoperability which can lead to communication breakdowns.

Social Networks, Social Capital and Trust

In considering the particular groups of participants in disaster situations coupled with the diversity of the individuals within those groups, a potential pathway to understanding effective communication between members is to understand their complexity as a network. As detailed in Chapter 2, stakeholders in a disaster situation are a diverse set of individuals and organizations. Because of this diversity, it is difficult to detail this social network in a concrete way. When looking at networks, as obscure as they can be, they are fundamentally based on the same principles as other networks: they contain individuals or groups (nodes) and these nodes are connected in various ways (Figure 3).

Figure 3: Simple Social Network



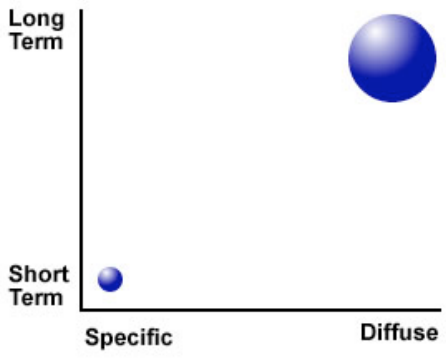
Among the potential frameworks for analyzing group interaction, the most popular form of social network theory is social capital. Bourdieu (1986) states that “social capital is the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition” (p. 248). Membership in this network then provides the individuals or nodes access to the collective capital of the network. “The volume of the social capital possessed by a given agent thus depends on the size of the network connections he can effectively mobilize and on the volume of the capital (economic, cultural or symbolic) possessed in his own right by each of those to whom he is connected” (p. 249). In disaster situations the social capital reserves of all stakeholders will be a key factor in how successful the response will be. High levels of social capital within a responding agency will enable better communication and resource flows.

The role of trust in social networks is also critical. According to Fox (1974), trust can be engaged in personal terms “but focuses on the notion that trust and distrust are embodied in the rules, roles and relations which some men impose on, or seek to get accepted by, others” (p. 67). Fox discusses high and low trust and describes them as being dynamic in the sense that they are liable to change in ways that could include self-reinforcement. He further suggests that “[t]rust tends to evoke trust and distrust tends to evoke distrust” (p.67). Trust and distrust are not independent of one another. Fox states that “as trust shrinks, distrust takes over” (p. 67). The balance of trust and distrust can then be perceived through the reciprocation taking place within the relationship. (See figure 4)

“Reciprocation can be measured along two dimensions: short/long term and that of specific/diffuse. The lowest trust point would be characterized by short-term specific reciprocation; the highest trust point by long-term/diffuse. In between these come long-term specific and short-term diffuse” (p. 72). In an emergency or disaster situation, long term diffuse trust among the stakeholders is critical because the levels of trust will directly influence the cooperation and thus, the communication paths for the individuals involved.

Another way to consider the role of trust in social networks is that the trust and distrust between groups or individuals is embodied in the habitus of the individuals. For example, a fire fighter may have entered into his career because of an altruistic desire to help people in need. This person may have some difficulty trusting a provincial employee whose motivations for taking a particular position may have been more pragmatic. Because these two individuals do not have shared habitus they are less likely to trust one another, which may, in turn, cause interference in the communication process and contribute to communication breakdowns.

Figure 4: Reciprocation of Trust



Fox (1974) also characterizes trust on a lateral versus vertical dimension. One example of a high level of lateral trust would be seen in an organization in which there was strong worker solidarity against management. In this case there would be a high level of lateral trust but a low level of vertical trust. Vertical trust exists when there are high levels of trust across multiple levels within a hierarchy. An example of a situation in which there are high levels of vertical trust would be trust between staff and management or, on a larger scale, trust between different levels of government. Situations in which there is high vertical and low lateral trust are indicative of ideologies of competitive individualism with highly differentiated levels of individual reward. Organizations that enjoy high levels of lateral and vertical trust are exceptionally favoured (p. 79); it is this environment of trust within a social network which enables its members to better overcome barriers to communication as trust reduces the friction that might add noise to the communicative process. Keeping in mind that although Fox's original work was with respect to the low-trust industrial relations of the mid 1970's, the framework he provided seems to hold true 30 years later in the case of emergency management.

Both vertical and lateral trust have important roles with respect to communication in the disaster management community. In the realm of emergency management, actors can consist of a broad cross-section with diverse backgrounds, experience, and even reasons for choosing their particular career. These distinctions will affect the levels of lateral trust particularly across departments, or in some cases, levels of government. For instance, an individual

who chooses a career in emergency management because of a desire to help the community (at whatever level) will likely be more receptive of lateral trust than an individual who was cast into the position of emergency manager by a superior. Such an individual might be more inclined to vertical trust rather than lateral because of the tendency for individualistic motivation. The network of disaster stakeholders in British Columbia is riddled with these complexities. In order to create a more resilient network and overcome the deficiencies, better understanding of the vertical and horizontal relationships and a better understanding of habitus is required.

An additional social variable that has an impact on the communication process in disaster situations is social capital. Social capital in this context could be described as the number and strength of an individual's or group's connections. Social capital can be an effective metric for gauging the commonality of habitus and, therefore, trust within a group. Most agencies involved in first response will typically have high internal reserves of social capital and thus have good communication within the organization. This is because first responders within a particular agency (e.g., a local police or fire department) will likely have shared habitus and thus have already established high levels of trust with one another. However, communication between multiple agencies is often not as successful, likely due to the lack of shared habitus, and thus a lack of trust which would serve to mitigate the noise that might interfere with effective communication. It is the social capital between the different first-response

agencies that is most important in a disaster response, because inter-agency communication is most at risk of communication breakdowns.

One of the problems with using social capital as a means of describing the social networks in disaster situations is that the networks are often unconcerned with capital. As a result, the principle of exchange that is important in one context may not be relevant in another. For example, the goals of responders in disaster situations might be more about good will towards the community than the motivation for profit. Social capital is a product of economic theory; however, as Bourdieu (1986) notes: “economic theory has allowed to be foisted upon it a definition of the economy of practices which is the historical invention of capitalism; and by reducing the universe of exchanges to mercantile exchange, which is objectively and subjectively oriented toward the maximization of profit” (p. 242). To reduce social capital to merely a metric of economic exchange may not always be useful, particularly when the social networks are fundamentally established and maintained for public good rather than economic exchange.

While social capital as a theoretical approach may not be well-suited to describing disaster stakeholder networks, it can still be useful as a guide if one goes beyond the economics of exchange to consider within this concept the additional factor of the conduits of exchange, or more specifically, trust. Trust is a particularly important component of social capital as it functions as one way to reduce or eliminate the “noise” or friction in the communication process that results from social and cultural barriers, due to lack of shared habitus. Therefore, the literature on social networks, social capital, and trust can be used effectively

as a framework to help us better understand some of the often-overlooked social variables that impact on communication in disaster response situations.

By utilizing a number of different metrics, Putnam (2000) has theorized that there has been a rapid decline in social capital. He further points out the dramatic decline in civic engagement and the remarkable declines in trust over time:

> There has been a 40-year steady decline, and a decline that is actually greater among American youth than among adults. Other analysis has shown very clearly that the decline in social trust in America is entirely generational, that is, if you look at any birth cohort, average trust has not changed over time, but each successive birth cohort over the last 30 to 40 years has reached adulthood with a lower level of social trust. (p. 45)

Putnam exemplifies an additional complexity of habitus: that there has been a quantifiable decline in trust across generations. This decline is an important component of the habitus of the individuals involved in disaster response which could have very subtle, yet profound, impacts on effective communication between stakeholders. Trust is central to all of the facets of the noise that impacts the channels of communication. Clearly, trust, or the absence of trust, will also have a critical role in communication during disaster situations because these are contexts that involve complex social interactions. The levels of trust that exist between individuals or groups will invariably impact the potential success of the communication.

Variations in power and trust between the different stakeholders in emergency management also need to be considered in order to understand fully the dynamics of habitus on trust relations. In any community there may be

instances or traditions of distrust through the multiple levels and forms of its bureaucracy. Fukuyama's (1996) work provides an interesting framework for understanding this added layer of complexity:

> Consider the question of government help for sunrise versus sunset industries. It may be possible in theory for technocrats in countries not at the leading edge of technology to pick industries or sectors for promotion, but political factors usually intervene to skew government policy in the wrong direction. By definition, sunrise industries do not yet exist and therefore have no interest groups promoting them. Sunset industries, on the other hand, are often big employers and usually have vocal and politically powerful proponents. (p.15-16)

While the context of Fukuyama's work is specific to industrial organizations, this work can be equally relevant to the field of disaster communications. Fukuyama is referring to the success or failure of industrial policy with respect to the relations of trust. The complexities of political intervention in industrial contexts are also important variables affecting the individuals or agencies involved in disaster situations, particularly when these same political interventions occur with respect to disaster policy. What is most relevant here are the variables that underlie decision-making by the bodies responsible for funding. The stakeholders in disaster situations are diverse; another key factor in this diversity is power, and since the levels of power are not homogenous, this is likely to inhibit both lateral and vertical trust among stakeholders, particularly where the differences in power relations are substantial:

> [C]oncentrated coercive power cannot be made trustworthy (or less utopianly, it cannot be made sufficiently trustworthy for its existence to be endorsed); secondly, dispersed coercive power … just is trustworthy, or at any rate it can readily be made and kept trustworthy (or less utopianly, it can readily be made and kept sufficiently trustworthy). (Dunn, 1988, p. 73)

It then stands to reason that if coercive power is brought to bear, not only will it not be trustworthy, but it will likely produce distrust (Fox, 1974).

Despite the complexity involved in these relationships within the emergency management community, the situation is not hopeless. There have been a number of experimental gaming studies in the field of social psychology, such as the "Prisoner's Dilemma Game" (Pruitt & Kimmel, 1976),[4] which have identified some important aspects of human cooperation and communication. The conditions under which people will cooperate fluctuate dramatically based on their level of communication. Good (1988) suggests that "The greater the amount of communication there is between the players in a wide variety of games, the greater the likelihood of a mutually beneficial outcome" (p. 4). While these studies were not necessarily intended as a way of measuring communication, they have improved our understanding of the process by providing quantifiable evidence to the dynamic relationship between communication and trust.

An additional factor that must be considered in an environment as complex as a disaster response is the importance of not only common language but common understanding. It has been suggested that any attempt to quantify the concept of communication must also take into account ambiguity. (Good, 1988): "The notion 'amount of communication' is by no means a simple one, and an important qualification concerning its benefit in bargaining or contractual situations concerns the degree of ambiguity potentially present in any

[4] Despite the dubious nature of many of the studies, any ethical quandaries that we may experience in the conducting of this research should not negate the potential benefits that come from the data gathered.

communication” (p. 4). Another way to consider this idea is that the likelihood of ambiguity in any communication increases relative to the variance in the habitus of two individuals or groups.

It is also important to note that cooperation between two groups does not equate to trust between the two groups:

> Cooperative behaviour by itself is not, of course, necessarily a sign of cooperative mentality. It could be cooperative by chance rather than by design. Similarly, a lack of cooperation need not indicate an uncooperative mentality; nor need it represent some deception or breach of trust. Consequently, while cooperation and trust are intimately related in that the former is a central manifestation of the latter, the former cannot provide, for either the actor or the analyst, a simple redefinition of trust. (Good, 1988, p. 2)

While cooperation and trust often go hand in hand, the presence of one does not guarantee the other. Nonetheless, increased cooperation between two is likely to bridge some of the gaps that variations in habitus can create.

In the same way that communication in disaster situations is not limited to coordinating between response agencies, the influence of variations in trust in these situations is felt beyond the responders. One of the most important components of communication in disaster situations is the part played by the media in bringing information about the disaster to their audiences. This relationship, however, is complicated by the very nature of the entities involved: the role of disaster responders to protect people and property and the role of private media to produce profits. Often, the self-interest of the media coincides with the goals of emergency responders, but it is not always the case. This

difference in goals can create huge gaps in trust that can directly affect the flows of communication.

One way in which this difference in goals between the media and the emergency responders can influence communication is when the private media attempt to attract audiences by creating a false or exaggerated sense of catastrophe. This situation occurred during the Loma Prieta earthquake in 1989:

> The day of the earthquake, the principal anchors from the three networks did their newscasts against backdrops of Earthquake destruction: ABC's Peter Jennings and NBC's Tom Brokaw in front of collapsed Marina district buildings and Dan Rather of CBS from the collapsed freeway viaduct on the other side of the bay. The visual emphasis was not proportionate to the damage or deaths. The three networks showed 102 shots of the Marina district, 69 of the damaged freeway, and 27 from Santa Cruz County, location of the epicenter…CBS and NBC had no video at all that first night from Watsonville, a city with far more damage than the Marina district. (Smith, 1992, p. 127)

The disproportionate images gave viewers the mistaken impression that the Bay area was in total ruin and that "San Francisco had fallen into the sea" (ibid, p. 127). It can be assumed that the reason the networks chose to show this particular footage was to attract viewers. Audiences around the world were glued to their televisions to view the destruction.

The mass media function in Canada as profit-driven entities; this orientation to profit is important in the way that the production of programming leads to certain kinds of choices being made in broadcast material, such as images of devastation being preferred to images of relative stability, a fact which can have a serious impact on communication during a disaster response. For example, in the case of the San Francisco (Loma Prieta) earthquake, people

around the world became concerned about the welfare of loved ones in the area of the earthquake, resulting in a huge volume of telephone calls. This consumed the available phone capacity needed for emergency response and added to the challenges posed by the earthquake itself. Although the technological barriers to communication in disaster situations are not specifically the purpose of this work, the interplay between the technological component and the social are important. In this case, the media served its own interests by representing the disaster visually with compelling images of destruction. These images then had a negative impact on the responders to the situation, illustrating how the seeds of distrust are sown. Whether the media filters the information (or misinformation) from ignorance or from an intention to garner increased ratings through sensationalism, the result is the same: relations between the media and other groups will remain guarded and the trust likely will be short term/specific. The consequences of this lack of trust can result in agencies withholding information from the media or not giving open access to information. The distrust in this situation can be disastrous, if it means that a public warning or an evacuation alert doesn't get broadcasted.

Summary

Communication interoperability is about much more than frequencies, or technologies; it is also about being able to create open networks of stakeholders with high levels of long-term/diffuse trust. Breakdowns in communication will undoubtedly occur as long as the stakeholders involved have low levels of trust or actively distrust one another. A better understanding of the habitus of

stakeholders, the dynamics of trust and the praxis of these variables in disaster situations is essential to improving communications and, more specifically, to limiting communication breakdowns in disasters.

Of the many areas discussed in this chapter, I would like to highlight two that I believe are the most important with respect to communication breakdowns in disaster situations: habitus and trust. Understanding the interplay between these two elements is essential in being able to mitigate communication breakdowns. In order to establish effective communication between stakeholders it is first necessary to understand that incompatible components of habitus can cause friction. Disaster situations are not unlike military operations, and as such, they are susceptible to many of the same sources of friction. In disaster situations, friction can come from internal and external sources. Krulak (1997) describes the effects of friction in a military situation:

> Friction may be mental, as in indecision over a course of action. It may be physical, as in effective enemy fire or a terrain obstacle that must be overcome. Friction may be external, imposed by enemy action, the terrain, weather, or mere chance. Friction may be self-induced, caused by such factors as lack of a clearly defined goal, lack of coordination, unclear or complicated plans, complex task organizations or command relationships, or complicated technologies. Whatever form it takes, because war is a human enterprise, friction will always have a psychological as well as a physical impact. (p. 5-6)

Despite the obvious differences between war and disaster response, there are many contextual similarities that should not be overlooked. The stressful context of a disaster situation creates enormous external friction, but the complexity of the stakeholder relationships also adds internal friction.

The second key social variable that has an impact on communication in disaster situations is trust, because it is one of the most important lubricants for internal and external friction. Friction exists in both military and disaster situations. The critical difference between a military context and a civilian disaster context is command and control. In a military context the command and control are very clearly defined. Disaster situations, however, involve many stakeholders who may not be aware of the incident command structure or may have divergent interests from the commanding agency. By working toward achieving a better understanding of the effects of habitus on stakeholder relationships and how habitus can affect the shared meanings that are essential for successful communication, we can begin to understand how friction can impact on the communication process. The next step in improving communication in disaster situations would be to establish higher levels of trust that would serve to lubricate this friction, and thereby reduce communication breakdowns.

In British Columbia, the provincial government has come a considerable distance in trying to bridge the gaps in habitus and trust between agencies. It has attempted to do this by offering a series of training programs to responders and emergency managers. These programs, while specifically designed to teach skills like hazard assessment or emergency planning, also serve a secondary role; to put stakeholders together in a non-emergency context. While these programs make a good start, a great deal more effort is required in order to generate a common habitus and facilitate trust between the various individuals, groups, and agencies involved in the disaster response process. The process of

trying to bridge the gaps in habitus and trust is complicated by the difficulty in identifying all the potential stakeholders involved in a given hazard. In the Firestorm 2003 transcripts, for example, many of the stakeholders commented on the absence of communication between agencies. As one individual notes:

> "We need to also — there should be an established — and this may already be established, but because of the fact that we didn't know about it means there was a communications breakdown — is liaison with local utility people — such as hydro, natural gas, railroads" (Ken Gauthier, Forest Service Cranbrook12103A, p. 37).

In the end, the expectation is that creating better links among all stakeholders will result in a more open communication rather than only improving communication between a few who happen to be in the loop. I believe this can be accomplished through a better understanding of the habitus of those involved in a disaster response along with further efforts to generate shared habitus and thereby increase trust among stakeholders.

CHAPTER 4: POST-DISASTER REPORTS

> I can tell you that in all my years of experience in fighting fires the expected state of affairs at any fire and on any large fire is controlled chaos. The complex and dynamic situation, incomplete information, poor communication, large and remote areas, the high number of agencies and workers and dangerous working conditions form a managerial nightmare. As complexities and values at risk increase, the stress level on managers increases and we all react differently to that stress. I have seen everything from guys that go to full bureaucrats where they fall back on policy and procedures and regulations and I have seen guys turn into Napoleons and Pattons. Everyone reacts a little differently every time. (Doug MacLeod, volunteer fire-fighter with the Keremeos volunteer fire department, Osoyoos, p, 15)

Document Review

In the aftermath of some recent disasters, the concept of interoperability and its role in communication breakdowns has received a great deal of attention, and has been particularly relevant since the September 11, 2001 attacks on the World Trade Center in New York City. The problem of communication breakdowns in disaster situations is not a new one. However, looking at the communication issues in the context of specific disaster situations can provide insight into some of the challenges and, hopefully, point the way toward some potential solutions to such breakdowns. What this thesis attempts to do is to integrate key ideas from a broad spectrum of literature in order to examine more

closely the role of interoperability in communication breakdowns among agencies and stakeholders in several specific disaster situations.

Disaster situations are, by their very nature, broad and complex situations. Consequently, this thesis brings together a range of literature that allows interoperability to be considered in a broader and more inclusive conceptual framework than is commonly used to understand this concept. The literature reviewed in Chapter 2 explored the areas of communication breakdowns and interoperability, while Chapter 3 brought together a diverse literature on the role of social networks, social capital, habitus, and trust. In this chapter, these concepts will each be considered in the context of specific disaster situations by reviewing post-disaster documents including The 911 Report (NCTAUS, 2004), Australian Bush Fires Report (Ellis, S., Kanowski, P., and Whelan, R. 2004), the California Fire Report and the Firestorm Report. This process allows the documents themselves to contextualize the problem.

These reports were created for a number of reasons, some political and some practical, but they all serve to ask what went wrong in various communication processes during these events, and what can be done to ensure that the same problems are avoided in the future. Although these documents may have contained issues much broader in scope than communication, in all of these documents communication was seen as being a major subject worthy of review. The 911 Report (NCTAUS, 2004), for example, identified many communication breakdowns that had an impact on the response to the World Trade Center attacks. The report states that “(a)ny attempt to establish a unified

command on 9/11 would have been further frustrated by the lack of communication and coordination among responding agencies" (p. 321). This comment highlights the common perspective that the response efforts were negatively impacted by communication breakdowns, most notably interoperability issues. The report further states, "the response operations lacked the kind of integrated communications and unified command contemplated in the directive. These problems existed both within and among individual responding agencies" (p. 319). It seems that these breakdowns had a significant impact on inter-agency communication. The description of the communication breakdowns at first makes the issue seem quite simple: providing the proper equipment and material resources to the various responding agencies should eliminate communication breakdowns, assuming, once again, that the implementation of new technologies will limit or reduce interoperability issues that lead to communication breakdowns in disaster situations. However, as mentioned in Chapter 3, intra and inter-organisational communication breakdowns are often caused by cultural, and not technological, noise in the communication process.

Unfortunately, the 911 Report (NCTAUS, 2004) focuses mainly on technological barriers to communication and provides few recommendations with respect to the social and cultural barriers to inter-agency communication. Instead, the focus of the recommendations is to suggest solutions along the technologic path:

> Congress should support pending legislation which provides for the expedited and increased assignment of radio spectrum for public safety purposes. Furthermore, high-risk urban areas such as New York City and Washington, D.C., should establish signal corps units

> to ensure communications connectivity between and among civilian authorities, local first responders, and the National Guard. Federal funding of such units should be given high priority by Congress. (p. 397)

While it is indeed important to implement recommendations such as these which focus on overcoming technological limitations or barriers to an effective disaster response, it is equally important to consider the human components of the response.

Based on the recommendations from the 911 Report, the first response of many groups was to develop a product to fill the perceived need for new communications technologies. Consequently, many firms worked to develop new radio and communication technologies, such as radio interoperability patches, with the goal of overcoming the technological interoperability issues. However, without first dealing with the issues of social and cultural interoperability, the impact of any technological fixes to interoperability will be limited. People need to know with whom they need to communicate, and how to communicate effectively within a given context. Any technological fix imposed on a situation where an individual doesn't understand appropriate discourse or procedures is likely to fail, because the technologies will only be as useful as the social framework in which they are deployed and, unfortunately, the social milieu in disasters is highly varied. In order better to define the social framework of disaster situations, one must consider interoperability from a broader perspective, one that takes into account the complex social variables that influence communication in a disaster response situation.

"Analysis of the 1993 World Trade Center bombing, the 1995 Oklahoma City bombing, and the standoff between the Federal Bureau of Investigation and Branch Davidians in Waco, Texas, in 1993, in which nearly 100 people died, all pointed to interagency communications as one of the weakest links in emergency management" (Mayer 2002, p.2). In large-scale disasters requiring a multiple inter-agency response, the intra-agency communication may suffer fewer breakdowns, in part, due to the fact that the people within the agency have access to a common technological structure. However, to consider only the technological structure of an organization downplays the importance of possessing a common culture or understanding within the agency. One way a common culture can be achieved is through the establishment of protocols. For example, The 911 Report (NCTAUS, 2004) suggests that the establishment of protocols was an important factor in increased interoperability during the disaster:

> The NYPD experienced comparatively fewer internal command and control and communications issues. Because the department has a history of mobilizing thousands of officers for major events requiring crowd control, its technical radio capability and major incident protocols were more easily adapted to an incident of the magnitude of 9/11. (p. 320)

Thus, it seems clear that although one agency in a disaster situation may have the ability to communicate internally with a minimum of breakdowns this, by itself, does nothing to mitigate breakdowns in communications between agencies. Although the NYPD may have had the capacity to communicate more effectively within itself than with other agencies, the 911 response required a coordinated and integrated response between many agencies.

The National Inquiry on Bushfire Mitigation and Management (Ellis et al, 2004) also comments on the key role of interoperability in communication breakdowns:

> ’Communications interoperability’ refers to the ability of two or more agencies to communicate effectively. Interoperability within states and territories is a jurisdictional matter, with governments commonly seeking to resolve the challenge through ‘whole-of-government’ radio systems. (p.137)

This document, then, also describes interoperability in an exclusively technological sense. What is potentially perilous about this view is the lack of regard for non-technological barriers to effective inter-agency communications. As detailed in Chapter 2, inter-agency communication is critical during a disaster response due to the sheer diversity of responders.

Based on the assumption that communication breakdowns in disaster situations are due, in large part, to technological barriers, one potential solution for reducing communication breakdowns might be to supply all agencies responding to a disaster situation with the same type of radios operating over the same frequencies. While there are some basic barriers to this solution — limited availability of channels and security issues are two of the most important — its relative simplicity is intrinsically appealing. Coordinating the technology should lead to a coordination of communication. However, this interpretation of interoperability in an exclusively technological sense is precarious: it overlooks the possibility that non-technological barriers to communication exist within and between agencies.

There are many complexities involved in facilitating communication among diverse sets of responders. Consider that the agencies involved in disaster response may be culturally very different from one another and, as a result, often approach a disaster from different perspectives. Thus, even if all technological barriers are removed, the human interoperability issues remain as barriers to communication. A “whole-of-government radio system,” a solution suggested in many of the post-disaster documents, will be much less effective in eliminating communication breakdowns without first considering how to create a common culture, or at the very least common cultural components, from which diverse emergency responders can communicate effectively. It may involve developing common protocols, such as those developed and utilized by the NYPD. However, the development of shared protocols is complicated by the fact that, for most agencies, their protocols arise from a cultural reality - the reality of their everyday existence and duties will dictate the shape and features of the protocols they design. This single factor will complicate any efforts to create common protocols between agencies.

Another issue when considering the recommendations from post-disaster documents is that communication is often discussed in a medium-specific manner; discourse is rarely seen as being a point of failure in the communicative process. In all these post-disaster documents, technological failure is cited as the primary source of communication problems. However, the technology necessary to solve many of the issues around interoperability is readily available from numerous vendors. In fact, many of the key agencies involved already possess

the equipment necessary to overcome technological interoperability issues. This suggests that there are still a number of other barriers necessary to overcome if successful inter-agency communication is going to take place in a disaster situation, and many of these barriers are non-technological.

An additional factor that impacts on how the various response agencies respond is organizational downsizing and restructuring. This may add to the friction that serves as noise or interference in the communication process:

> I believe that all the planning on the local level does not matter if, when in an emergency all the planning [is] overruled by higher-ranking agency people who may be unaware of plans or are disconnected from the affected area. Much more needs to be done if we are to replace the infrastructure lost when local government services like the B.C. Forestry were removed from rural areas and were moved to cities which are disconnected from rural needs. Emergency response and Forestry response in rural areas need to be addressed locally and with local people who know the area and have access to local resources. (Tim Hockey, Fire Marshal for Tolko Luis Creek, Barriere111203 p, 9)

Whether these barriers exist between local agencies versus provincial agencies, or between provincial agencies such as the Office of the Fire Commissioner and the B.C. Forest Service, they may exist at all levels of government and all varieties of agency.

Firestorm 2003

In the summer and fall of 2003, British Columbia was affected by a series of interface fires[5] that devastated communities. The fires left in their wake a number of questions regarding the response prior to, during and after the events. In response to these questions, the Province of British Columbia created a

[5] Interface fires are forest fires that encroach upon human development.

commission whose purpose was two-fold: to inquire into the response to the 2003 wildfire season; and to inquire into concerns brought forth by the various communities, as well as other stakeholders in the province. This commission, headed by former Premier of Saskatchewan, Gary Filmon, resulted in the report titled Firestorm 2003 (Filmon, 2004).

A detailed analysis of post-disaster documents is critical in planning and preparing for future disasters, because these reports often become the frameworks for future policy and legislation. As such, they need to undergo a certain amount of scrutiny to determine if the conclusions or assumptions contained within them are appropriate. Ambiguity at any level will likely be carried forward, resulting in flawed or incomplete recommendations (i.e., ambiguity in the discourse in the transcripts will likely lead to ambiguity in the report, which will likely lead to ambiguity in the recommendations or solutions posed by the report).

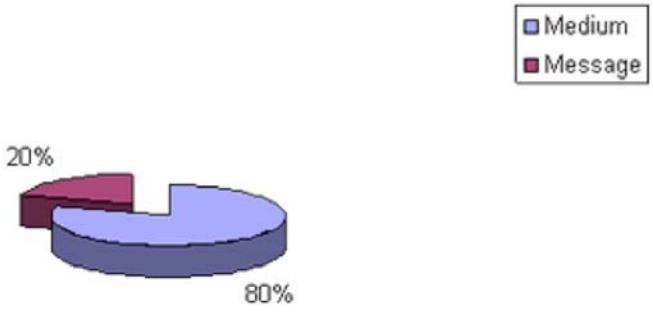
Exploring communication issues in a specific disaster situation can help to understand better the role of communication in disaster situations. In my analysis of the Firestorm 2003 Report, I will attempt to evaluate two hypotheses regarding communication breakdowns in disaster situations. The first hypothesis is that there is a greater amount of discourse regarding the medium of communication rather than the human aspects of communication. The second hypothesis is that the final post-disaster document, the Firestorm 2003 Report, will not accurately represent the issues as identified in the transcripts that were used to develop the report.

The Firestorm 2003 Report is the culmination of approximately 1,000 pages of transcripts from public meetings that were held in the areas of British Columbia impacted by the 2003 wildfires. The communication breakdowns that were identified by the participants are of particular interest in this chapter. According to the Firestorm 2003 Report, “communication was one of the central themes that emerged during the Review Team's consultation process and was an issue in every community. Almost all aspects of the response to the 2003 wildfires involved communication in some form or another” (p, 44). And, while communication is essential to any disaster or emergency, where coordination of two or more groups is required, it is often the least understood process.

When discussing communication breakdowns, it can be difficult to identify with certainty the source of the problems. In fact, there are often numerous contributing factors whose effects can be difficult to tease apart. This is also true of disaster situations. After reviewing several post-disaster documents, it became clear that the factors contributing to communication breakdowns were frequently a subject of discussion. However, the discourse in these documents regarding the influence of technological factors on communication breakdowns far exceeded the discussion of the social dimensions of communication. The coding of these instances was simply a matter of identifying if each reference to the term ‘communication’ in the documents was intended to refer to the message (i.e., the social components or the medium, i.e., the technology). For instance, in one document it was stated that “During the October 2003 Fire Siege, incompatible communication systems and technology often made it impossible for strike teams

to communicate with incident commanders" (California Fire Report, p.16). This reference to communication would be coded as referring to the medium of communication due to its interest in systems and technology. In contrast, in another document the following comment was made: "According to Mayor Slater, information officers in these agencies did not communicate with each other, and at times, each transposed communication into different words and meanings, resulting in incorrect information being released to the media" (Firestorm 2003 p.44). Because this instance refers to the process and content of communication, it would be categorised as being related to the message rather than the medium. As Figure 5 shows, 80% of the discourse in four major post-disaster reports concerned the technological aspects of communication.[6]

Figure 5: All Reports – Discourse Regarding Communication/s

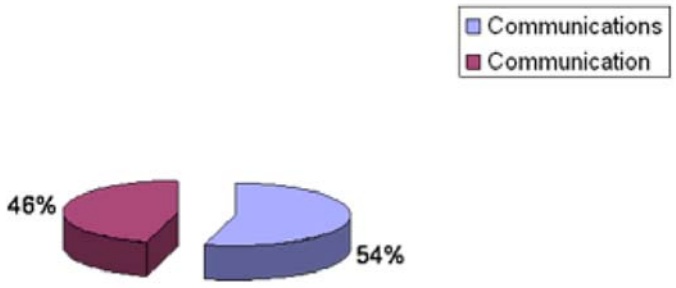


What this likely indicates is that the technological side of communication will receive the most amount of attention with respect to policy, and since funding is intrinsically linked to policy, it will also receive more financial support. This increases the stakes of post-disaster commissions and reports significantly.

[6]The four reports used here were, "Firestorm 2003,", "The 911 Commission Report," "The Governor's Blue Ribbon Fire Commission Report," and "A Nation Charred: A Report on the Inquiry into Bushfires". The total number of occurrences of the terms communication/s was 881.

Seemingly simple oversights or misinterpretations can result not only in misguided public funding programs, but also in loss of life and property. As such, these documents need to be considered from various perspectives in order to determine if they are indeed an accurate reflection of the issues. Initially, the analysis of the documents was limited to comparing the transcripts to the final report to determine if the issues, as they arose in the final report, were representative of the transcripts from which they were derived. Figure 6 shows that 54% of the occurrences communication/s referred to communications while 46% referred to communication[7].

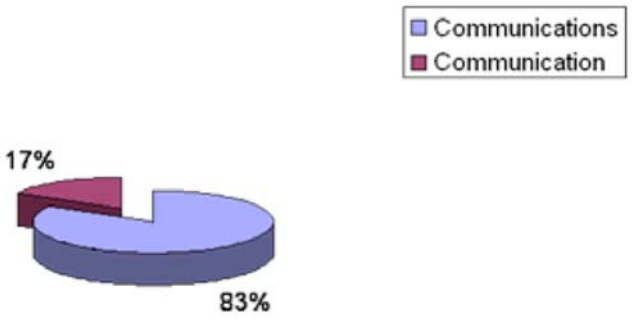
Figure 6: Firestorm 2003 Transcripts - Occurrences of Communication/s



Comparatively, as Figure 7 represents, the percentage of occurrences of the term *communications* in the final report shot up to 83% and the number of references to *communication* dropped to 17%.

[7] There were a total of 414 uses of communication or communications in the transcripts from the Firestorm 2003 Report and 123 from the report itself

Figure 7: Firestorm 2003 Report - Occurrences of Communication/s



From a purely numerical perspective, the ratio of occurrences of the terms *communication* and *communications* were not proportionate between the documents. There was almost 30% difference between the percentage of occurrences of *communication* versus *communications* in the original transcripts displayed in Figure 6 and that of the final report, which is displayed in Figure 7.

Customarily, in communication studies, this method of counting the number of references to *communication* and comparing it to the number of references to *communications* would indicate the relative importance (at least numerically) of the technological aspects of communications and the social and cultural aspects of communication. However, in reviewing the documents, it soon became apparent that the terms *communication* and *communications* were being used synonymously. Typically, *communication* refers to the act of communicating — the message, whereas *communications* usually refers to the infrastructure involved in communicating — the medium. Figure 7 shows a significant difference between the occurrences of the two terms, which, if the terms are being applied correctly, should mean that there was much greater discussion of the medium rather than the message. In reviewing the documents, it soon

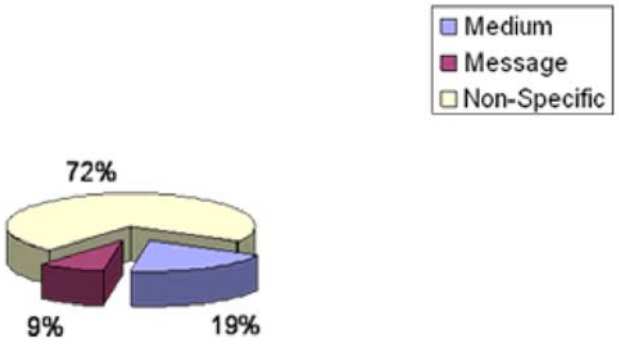
became clear that such a distinction would not be possible by merely counting word usage and would not be an effective means of distinguishing between the medium and the message.

In an attempt to evaluate all of the occurrences of the terms, each reference to *communication* and *communications* was considered in the context in which it was written. However, in this contextual analysis of the usage of the terms a slightly different pattern evolved. It was apparent that many of the uses of the terms *communication* and *communications* were incorrect, at least according to common usage. It then became necessary to consider each usage of the terms in the context with which they were used and identify whether the speaker was referring to the medium or the message.

The difference in results between a numeric and a contextual analysis of the medium versus the message identified a whole new category for consideration — ambiguous, or non-specific, communication/s usage. This new category includes all of the occurrences of communication or communications which are unidentifiable in context as referring to either the medium or the message. In Figure 8, 19% of the discussion was referring to the communication medium compared to 9% of the occurrences which referred to the message. This means that, not only were the occurrences of discussion regarding the medium or the message imbalanced (which supports the first hypothesis, which was that there would be a greater discussion of the technological aspects of communication rather than the human aspects), the contextual analysis has led to the creation of a new, and perhaps more important category. The “non-

specific" category includes all of the references to communication and communications that were unclassifiable in context as either relating to the medium or the message and represented 72% of all of the references to communication/s in the Firestorm 2003 Report.

Figure 8: Firestorm 2003 Transcripts - Contextual Analysis Of Communication/s

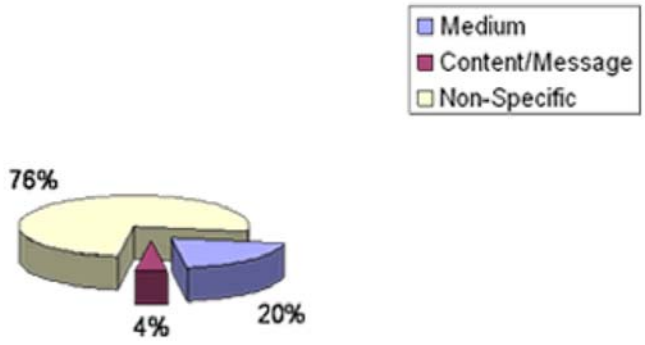


There are some obvious problems in making this distinction. First and foremost is that the identification and further use of the typology (medium, message, and non-specific) in this pilot study potentially presumes that the subjects erred in the way that they used the terms *communication* or *communications*. However, this is not necessarily the case. It is possible that a certain amount of ambiguity in terminology is a product of the contextual analysis performed in this thesis rather than deriving from misuse on the part of the subject. It is also possible that the number of ambiguous references to communication/s is due to the strict criteria used to categorize certain phrases or passages that fell bellow a threshold of certainty. In this case the 72% may reflect the researchers criteria as much as anything. In future research defining the criterion and coding would be critical, as well as initially testing this ambiguity

with a group of participants in order to establish clearer parameters for the research and then establish intercoder reliability. Nevertheless, for the purposes of this study, this potential flaw should be considered acceptable or at the very least not relevant to any conclusions that this study may make. Particularly since this thesis makes no attempts at statistical validity. Any results will simply direct future research in this area.

It should also be noted that contextual analysis identified an increase in discussion regarding the content or message in the final report compared to that in the transcripts. However, there were two specific hypotheses being tested in this process. The first hypothesis suggested that there would be more references to technological barriers than to social and cultural barriers. This hypothesis was supported as is shown in Figure 9 where 20% of the discussion focused on the medium compared to 4% that concentrated on the message and 76% which was non-specific usage.

Figure 9: Firestorm 2003 Report- Contextual Analysis Of Communication/s



The second hypothesis, that the final report would not be representative of the transcripts from which it was created, was also supported. Figure 8 shows

the number of references in the transcripts to the message were 9% of the total references to communication/s. In the final report, however, only 4% of all of the communication/s references concerned the message.

The variations between the transcripts of the Firestorm 2003 Report and the Report itself in the non-specific use of the terms communication and communications may be an important indicator of a much larger problem. The disproportionate number of ambiguous references to communication/s is, in many ways, not surprising. The lack of a common understanding or common meaning within the discourse may be indicative of the variations in habitus between the various stakeholders. The source of common understanding is in the shared common bonds in the habitus of the individuals. It allows people to speak in a common language with shared meaning. The protocols used by a police officer, an employee of public works, and a utility company worker may have similar terminology but completely different meanings. These components of the habitus of an individual can display themselves to greater and lesser degrees as non-specific or vague terminology.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

Summary

The juxtaposition of the various bodies of research used in this thesis has led to a new perspective on the important role of social barriers to communication in disaster situations. The resulting product is a series of recommendations that serve to increase trust among stakeholders and thereby positively impact on communication in disaster situations. More importantly, I hope it will be a useful tool to assist practitioners in the field in developing, maintaining and strengthening the relationships among stakeholders.

Much more is involved in knowledge transfer than radios and telephones. It requires a common framework from which speakers can impart shared meaning. The challenges of trying to communicate with someone in Chinese when the other person only speaks English the barriers are obvious. However, if both people speak the same language but do not have shared meaning, the communication still has potential to go awry. Despite only subtle differences, the impact on communication can be much more profound because both parties may assume comprehension without actually obtaining it. It is better to know that the communication has failed than to assume erroneously that it has been successful.

Trust and communication are the two primary (and perhaps only) means of overcoming the barriers due to differences in habitus. Or, another way to

consider this interaction is that trust and communication are the means of establishing common aspects of habitus.

It is important to recognize that trust, communication, and habitus cannot be thought of as mutually exclusive. Having common ties within the habitus implies a certain level of trust and communication, and although this study can not presume that it is possible to create a common habitus among all disaster stakeholders, it does argue that building trust, and having open communication among stakeholders, will help to develop common habitus among some if not all of the stakeholders. It is unlikely that these problems will be solved by purchasing new radios or gaining access to more radio frequencies; however, considering the role of habitus and trust and the technological factors together will create much more resilient communication networks in disaster situations.

The most important component in any aspect of either disasters or communication is the people. At times it seems that we lose focus on this ultimate truth. In order to overcome any obstacles that we may have with respect to communication, we need to look at ourselves, at our relationships and at our social networks. These are the variables that serve as the foundations of communication. In all of the post-disaster documents I reviewed for this thesis, communication was consistently referred to as being essential to any type, and all aspects of, disaster response. Despite the important nature of the entire process of communication, there is a definite lack of regard to the entire communication process. Until we look at the whole process, rather than only the finite components, we will likely continue to have a multitude of barriers to

communication that continue to be unaddressed. And while these barriers can often be due to technological factors, I suggest that the human variables are equally important in establishing and maintaining effective communication in a disaster situation.

The realm of disaster communication is a terribly complex subject. The complexity is compounded by a lack of understanding of the process of communication. As the analysis of the post-disaster documents has shown, there is a lack of universal understanding of terminology as well as of concepts surrounding the terms *communication/s* and *interoperability*. This lack of common understanding can be explained through the understanding of habitus and the impact that habitus can have in understanding everyday processes such as communication. We all communicate; some may even argue that it is our ability to communicate that defines our humanity. However, we do not all conceptualize communication in the same way. In addition to habitus shaping the varied interpretations of these terminologies, habitus also impacts the way in which we engage in communicating as well.

In order to overcome the barriers of habitus, as well as many of the technological barriers, knowledge of, and trust among stakeholders is imperative. This process must occur over long periods of time and is certainly not a quick fix. It involves people working with one another on a frequent basis. As a rule, if you introduce a new technology, such as a new radio or computer-tracking system, into a stressful response environment, there likely will be increased chance of failure, because most new communication technologies must be configured to

work with the pre existing technologies, and some new technologies are so different they will never be able to communicate with pre-existing technologies. The same is true of people. If you place people into highly stressful environments without being configured to work within the social network in place, they will have an increased likelihood of communication breakdowns with one another, due to their unfamiliarity with the people with whom they are communicating. They are unfamiliar with the habitus of the environment and they may not yet have developed any trust to overcome the barriers to communication. Thus it is important in a disaster situation that stakeholders be familiar with each other and the processes through which each group or individual functions in order to overcome the barriers due to differences in habitus. More importantly, they need to trust one another.

The trust between stakeholders is a very complicated problem, particularly since our society provides an environment of rapidly declining social trust. Putnam (2000) identified two different types of trust, 'thin' and 'thick,' and suggests that there has been a significant decline in the former: "Perhaps thick trust — confidence in personal friends — is as strong as ever…. however, thin trust — the tenuous bond between you and your nodding acquaintance from the coffee shop, that crucial emollient for large, complex societies like ours — is becoming rarer"(p.142). The most important component in overcoming declining thin trust is contact. The more contact that individuals have with one another, the more likely they are to establish a degree of trust. This contact may take many different forms including frequent emergency exercises, conferences, breakfast

meetings, etc. However, these formal events are a necessary, but not sufficient, requisite to the development of trust. There must also be informal social events that will allow stakeholders to interact in a less contrived way. It is in these more casual social interactions that the opportunities to explore and understand one another's habitus will likely present itself and help to strengthen the bonds of trust among the stakeholders.[8]

There are a great number of impediments to this process that must be overcome before any of these suggestions could take place. The first barrier to overcome is in stakeholder identification and incorporation. Although stakeholder identification has occurred, it needs to be an ongoing process. In addition to identification, stakeholders must also be incorporated into the network so that they may draw from and contribute to the ultimate knowledge and resources of the group. Identification of stakeholders is particularly problematic when not all stakeholders are in their management position fulltime and cannot always spare time away from their duties to engage in social activities.

Recommendations

Communication Research

Much more work is necessary in the process and publication of post disaster assessments, particularly with respect to communication. The analysis of these documents highlighted the serious absence of a methodical discussion of communication issues. Thus, one area that needs further study is in the

[8] It is very important to note here that in addition to building trust through the exploration of habitus, it is also possible to weaken trust as well.

standardization of ambiguous terms in these post-disaster documents. Terms such as *communication*, *communications*, and *interoperability* must be defined and at times redefined in order to ensure that the intended meaning is conveyed appropriately.

Another issue in disaster communication is the focus on engineering-related issues with communications (e.g., frequency allocations and radio interoperability). The absence of discussion of the social factors that contribute to these technological issues makes it difficult to address the fundamental problems. What is needed is a holistic approach that engages the entire communication process. There is an abundance of discussion from communications experts willing to attest to all of the technological barriers to communication, but what is required is a communication expert fully capable of engaging the entire process regardless of the technology.

Such an expert would be able to consider areas where social issues interact with and impact the technological, such as how new technologies are introduced to a situation. Often the introduction of technologies can be a source of friction, if not distrust. When new technologies are imposed from the top down, it can create feelings of animosity and distrust between the users and the imposers. The problem is that there is a dearth of individuals capable of both information and communication technology (ICT) assessment and the social variables of ICT. There is an obvious problem with respect to communication in disaster situations; however, there is a lack of input into the process from those qualified to comment on the process. Although there is recognition that

communication is important, there is a failure to understand that it is not a simple process that can be overcome by lay people.

All levels of government need to commit more money and resources to disaster stakeholders. There are a number of hard-working and creative individuals working in the emergency management field. Unfortunately, these individuals are often trying to function with limited resources and stringently defined agendas. We need to provide these individuals with a new mandate to effect long-term change and the resources necessary to accomplish this mandate. A commitment from government is required to fund not only the necessary communications technologies that will enable effective communication, but also long-term funding is required to sustain the ongoing process of communication and research. Collaborating and developing partnerships with the universities can offset some of the costs of this research.

The Future of Trust in Disasters

While it is important to consider the impact of trust in disaster situations, it is equally necessary to focus on trust between people or groups prior to the occurrence of a disaster. Trust is important during a disaster, but in order to develop long-term diffuse trust there needs to be a concerted effort to build and sustain trusting social networks prior to the occurrence of an event. By establishing these connections prior to an event the resiliency of the network will be able better to cope with any variables that may occur in moments of crisis.

Although this thesis has focused on the development of trust among the typical stakeholders in disaster situations, such as the forest fire event in Central British Columbia has shown, stakeholders are not always the official responders or utilities. Any resident of any community could be considered a responder. Often these residents may have intricate knowledge of the terrain or the economy of the region and could provide critical resources for response. These individuals are often overlooked or unidentified. In establishing trusting social networks it is advisable to commit greater resources to building trust among these community stakeholders as well.

In some cases, there may be communities during an event that may be cut off from the common communications or power grid. It is imperative that these communities have the resiliency to be able to cope with the event internally until help can arrive. In some events, this may take seventy-two hours or longer. Developing social networks among the citizens may enable them better to care for one another in these times of crisis. Trust serves to alleviate not just communication breakdowns in disaster situations, but also social breakdowns. This becomes a much greater issue worthy of more study, but with further research it may be possible to develop a set of indicators for use with communities to help identify those communities that may be at greater risk of communication or social breakdowns due to lack of trust. The transience of the population, language/cultural barriers, education, and many other easily identifiable indicators may be useful tools in identifying at-risk populations.

However, the political will and the economic resources committed to pursuing this approach to disaster mitigation appear to be lacking despite the evidence that this approach is likely not only to improve disaster resiliency, but also likely to improve the economies of the regions as well. Long-term commitment from governments needs to support communities in developing resiliency not only on economic terms, but in social terms as well. This commitment may involve something as simple as helping individuals to have community events. Not the type of events where a government employee or politician simply goes and gives a speech and everyone eats muffins and drinks coffee, but working with the communities to engage them on their own terms recognizing cultural differences. By recognizing these differences and embracing them, where possible, we can then establish a conduit through habitus to develop trusting relationships.

Further Research

There are a number of issues that have been made apparent in the course of conducting this research, and there are several specific items that should be considered in future research. The ambiguous category must be eliminated, and this should be done through several alterations in the research techniques. First, performing primary research will provide much fuller results and will enable the researcher to clearly define the subjects comments into a particular typology. Second, it would be interesting to more clearly identify the subjects based on their backgrounds/professions in order to put them into a specific context.

Conclusion

The juxtaposition of the various bodies of research explored in this thesis has led to a new perspective on the important role of social barriers to communication in disaster situations. The resulting product is a series of recommendations that serve to increase trust among stakeholders and thereby positively impact on communication in disaster situations. More importantly, I hope it will be a useful tool to assist those in the field in developing, maintaining, and strengthening the relationships among stakeholders.

REFERENCE LIST

Bourdieu, P. (1986). "*The Forms of Capital*". **Handbook of Theory and Research for the Sociology of Education**. J. G. Richardson. New York, Greenwood Press: 241-258.

Bourdieu, P. and Wacquant, L. J. D. (1992). **An Invitation to Reflexive Sociology.** Chicago, University of Chicago Press.

Cisco Systems Inc. (2005). **Solutions for Communications Interoperability**, Cisco Systems Inc.

Creswell, J. W. (2003). **Research Design : Qualitative, Quantitative, and Mixed Method Approaches.** Thousand Oaks, Calif, Sage Publications.

Dunn, J. (1988*). "Trust and Political Agency".* in **Trust : Making And Breaking Cooperative Relations.** D. Gambetta. New York, NY, B. Blackwell: 73-93.

Ellis, S., Kanowski, P., et al. (2004). **National Inquiry on Bushfire Mitigation and Management.** Canberra, Commonwealth of Australia.

Filmon, G. (2003). *"Barriere111203*". **Firestorm 2003: Provincial Review.** Victoria, Province Of British Columbia: 72.

Filmon, G. (2003). *"Barriere111203B".* **Firestorm 2003: Provincial Review**. Victoria, Province Of British Columbia: 12.

Filmon, G. (2003). *"Chase112803".* **Firestorm 2003: Provincial Review.** Victoria, Province Of British Columbia: 81.

Filmon, G. (2003). *"Cranbrook12103A".* **Firestorm 2003: Provincial Review**. Victoria, Province Of British Columbia: 62.

Filmon, G. (2003). *"Cranbrook12103B".* **Firestorm 2003: Provincial Review**. Victoria, Province Of British Columbia: 35.

Filmon, G. (2003). *"Cranbrook12103C".* **Firestorm 2003: Provincial Review**. Victoria, Province Of British Columbia: 33.

Filmon, G. (2003). *"Kamloops111303".* **Firestorm 2003: Provincial Review**. Victoria, Province Of British Columbia: 81.

Filmon, G. (2003). *"Kamloops111303B".* **Firestorm 2003: Provincial Review**. Victoria, Province Of British Columbia: 17.

Filmon, G. (2003). *"Kelowna112603A".* **Firestorm 2003: Provincial Review**. Victoria, Province Of British Columbia: 72.

Filmon, G. (2003). *"Kelowna112603B".* **Firestorm 2003: Provincial Review**. Victoria, Province Of British Columbia: 46.

Filmon, G. (2003). *"Kelowna112703A".* **Firestorm 2003: Provincial Review**. Victoria, Province Of British Columbia: 75.

Filmon, G. (2003). *"Nelson12203A".* **Firestorm 2003: Provincial Review**. Victoria, Province Of British Columbia: 66.

Filmon, G. (2003). *"Kelowna112703B".* **Firestorm 2003: Provincial Review.** Victoria, Province Of British Columbia: 55.

Filmon, G. (2003). *"Nelson12203B"*. **Firestorm 2003: Provincial Review.** Victoria, Province Of British Columbia: 35.

Filmon, G. (2003). *"Osoyoos".* **Firestorm 2003: Provincial Review.** Victoria, Province Of British Columbia: 35.

Filmon, G. (2003). *"Penticton112503A".* **Firestorm 2003: Provincial Review**. Victoria, Province Of British Columbia: 64.

Filmon, G. (2003). *"Penticton112503B".* **Firestorm 2003: Provincial Review**. Victoria, Province Of British Columbia: 52.

Filmon, G. (2004). **Firestorm 2003: Provincial Review.** Victoria, Province Of British Columbia: 100.

Fox, A. (1974). **Beyond contract : work, power and trust relations**. London, Faber.

Fukuyama, F. (1996). **Trust : the social virtues and the creation of prosperity.** New York, Free Press.

Gambetta, D., Ed. (1988**). Trust : Making And Breaking Cooperative Relations.** New York, NY, B. Blackwell.

Good, D. A. (1988). "Individuals, Interpersonal Relations, and Trust. in" **Trust : Making And Breaking Cooperative Relations.** D. Gambetta. New York, NY, B. Blackwell: 31-48.

Governor's Blue Ribbon Fire Commission (2004). **Governor's Blue Ribbon Fire Commission: Report to the Governor.** Sacramento C.A., Office of the Governor: 247.

Hall, S. (2006) "Encoding/Decoding" in **Media and Cultural Studies: Keyworks.** Durham M.G., & Kellner D.M. Oxford, UK : Blackwell 166-176

House of Representatives Select Committee Into The Recent Australian Bushfires (2003). A **Nation Charred: Report On The Inquiry Into Bushfires.** Canberra, Commonwealth of Australia.

Hurricane Katrina Independent Panel (2006). **Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks: Report and Recommendations to the Federal Communications Commission.** Washington DC, Federal Communications Commission: 51.

Mayer-Schönberger ,Viktor (2002) *"Emergency Communications: The Quest for Interoperability in the United States and Europe."* BCSIA Discussion Paper

2002-7, ESDP Discussion Paper ESDP-2002-03, John F. Kennedy School of Government, Harvard University.

McLuhan, M. (1964). **Understanding media: the extensions of man.** New York, McGraw-Hill.

NYMAG (2007). *"9/11 by the Numbers"*, **New York Magazine.** Retrieved August 1, 2007, from http://nymag.com/news/articles/wtc/1year/numbers.htm.

Palys, T. (1997). **Research Decisions : Quantitative and Qualitative Perspectives.** Toronto, Harcourt Brace & Company Canada.

Pruitt, D. G. K., Melvin J. (1977). *"Twenty Years of Experimental Gaming: Critique, Synthesis and Suggestions for the Future."* **Annual Review of Psychology** 28: 363-393.

Public Safety Wireless Network Program (1999). **Public Safety and Wireless Communications Interoperability: Critical Issues Facing Public Safety Communications**: 8.

Putnam, R. D. (2000). **Bowling alone : the collapse and revival of American community.** New York, Simon & Schuster.

Putnam, R. D. (2001). *"Social Capital: Measurement and Consequences."* **Canadian Journal of Policy Research** 2(1): 41-51.

RBP Associates (2003). **Public Safety Radiocommunications Project: Final Report**, Industry Canada: 81.

Schmitt, J. (1997). **Warfighting.** Washington DC, United States Marine Corps.

Shannon, C. E. (1949). **The Mathematical Theory of Communication.** Urbana, University of Illinois Press.

Smith, B. and T. Tolman (2000). *"Can We Talk? Public Safety And The Interoperability Challenge."* **National Institute of Justice**(April): 16-21.

Smith, C. (1992). **Media and apocalypse : news coverage of the Yellowstone forest fires, Exxon Valdez oil spill, and Loma Prieta earthquake.** New York, Greenwood Pub. Group.

The National Commission on Terrorist Attacks Upon the United States (2004). **The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks Upon the United States**. New York, Norton.

Yates, D. (2007). **Communication Model.** 2007.