

20th ICCRTS

Global model for direction and coordination in multi-actor crisis management

Topic: Concepts, Theory and Policy

**Olof Ekman
Christian Uhr**

Olof Ekman
Swedish Civil Contingencies Agency
SE-651 81 Karlstad, SWEDEN
+46 725 658877
olof.ekman@msb.se

A global model for direction and coordination in multi-actor crisis management

Abstract

Direction and coordination in multi-actor crisis management contexts are persistently hampered by three issues; misunderstandings through diverging and fragmented terminology, a focus on activities rather than effects, and engagement in relations with pre-identified actors which shadows emergent actors on the scene. This concept paper draws from the results of a two-year Swedish governmental-led multi-actor project and suggests a global theoretical model which addresses these three issues. The model defines and interrelates four central terms - command, collaboration, direction and coordination. Design logic is exploited from a systems perspective in order to establish command and collaboration as functions and direction and coordination as effects. The model finally recognizes other bases for command than legally based mandates. Thus the model acknowledges what disaster and crisis research has been demonstrating for years but has so far been lacking in practitioner's normative underpinnings. The paper argues this model as a useful basis for global crisis management.

Introduction

This paper reflects a selection of the process and results of a two year project undertaken by the Swedish Civil Contingencies Agency 2012-2014 in order to reduce identified crisis management shortfalls across organizational borders. The project involved more than one hundred actors from the national, regional and local level and exploited design logic in the development process. The project resulted in a set of national guidelines for the response phase of crisis management.

The focus of this paper is one of the guidelines' theoretical underpinnings; a theoretical model for direction and coordination developed by us, the authors.¹ As anchored in current theory we believe that the model is not only applicable to both military and civilian crises, but also culturally acceptable on both sides. As such the model should be useful for bridging inter-organizational friction in general and civil-military in particular in joint responses. While the model was motivated by shortfalls identified in the multi-actor response context, we argue that the model is useful in all stages – before, during and after a crisis.

One conscious choice for such cultural acceptance is choosing the terms “command” and “collaboration”. While the military domain has as a tradition in the expression ‘command and

¹ The development during the project relied on invaluable input from a great number of people and especially grateful are we to Berndt Brehmer, Lars Fredholm, Samuel Koelega and Erik Cedergårdh.

control', or 'C2', to signify the direction of capability² for a common goal, civil contexts often prefer the term 'coordination'. for the same meaning. Conversely, the military commonly regards 'coordination' as a subset to command and control (Uhr, 2009). The proposed model takes a slightly different road by using the term 'command' when one actor has authority over other actors and the term "collaboration" when such authority is lacking or not exploited. Using 'command' in this way is inspired by Pigeau and McCann (2002)³ but here employed with a tweak⁴. We also agree with Brehmer (2009) that the overall purpose is to produce direction and coordination.

Method

Before moving onto the model a few words on design logic are needed (see e.g. Jensen, 2010 and Rasmussen, 1985). For example, the reader will encounter the term "function" several times, which in this paper has a special meaning due to the use of design logic in its construction.

Design logic is a schema of concepts which may be used to construct or understand something man-made, artefacts (Simon, 1996) on different levels. Here command and collaboration are regarded as artefacts. In its most basic form design logic consists of three levels.

The highest level of analysis refers to the purpose of the artefact and answers the question why the artefact exists. The next level refers to the function of the artefact answers what the artefact has to produce in order to fulfil its purpose. Since the function level is abstract only the results may be observed, not the function in itself. The third level refers to the form of the artefact and answers the question how the function of the artefact is realized.

However, when constructing an artefact there are often requirements that it should fulfil its function in certain ways. These requirements constitute design criteria. The resulting design logic hierarchy is presented in figure 1 below.

PURPOSE	Why?
DESIGN CRITERIA	In which way?
FUNCTION	What?
FORM	How?

Figure 1. Design logic with four levels

² We associate capability with an agent (e.g. organization, person or technical system) and the agent's capability of perform a task in an event related to a response and by performing this task generate a desired effect (Lindbom, Tehler, Eriksson and Aven, 2014)

³ "Command: the creative expression of human will necessary to accomplish the mission" (Pigeau and McCann, 2002:56)

⁴ While Pigeau and McCann (2002) link command to control, this paper advocates using the term 'command' as a standalone, i.e. not employing the term 'control' but letting 'command' embrace also the structures and processes which Pigeau and McCann (2003) associate with 'control'.

Importantly, the project, and subsequently the model presented in this paper, is anchored on the function level rather than the form level. In other words, the model describes what is produced, but not how this is done. The reason for this is the great variety of contexts to which the model must apply and for which it would be impossible to describe all practical variants of command and collaboration. The implications for this from an end-users perspective is commented on in the discussion.

Result

The direction and coordination model was constructed based on a number of perspectives which gradually developed during the project. These perspectives constitute the model purpose as well as its design criteria, presented in the following.

Purpose of the model

The purpose of the model is to influence how actors think about command, collaboration, direction and coordination across organizational boundaries. Specifically this influence is to: (1) establish a complementary rather than invasive standard; which (2) stimulates a systems perspective and a needs-effects thinking; (3) erases obsolete views on mandates; and, (4) offers an operationally useful set of interrelated definitions of core terms.

The purpose is to be achieved by creating a common theoretical ground for direction and coordination on the function level according to design logic, as a complement to the actors' own culture including terminology, norms and values. This theoretical ground is developed in the following.

Actor commonalities and differences

Crisis management professionals have one thing in common – they strive to translate capability into tailored effects. Unfortunately their collaboration across organizational borders is often hampered by differences in many other respects. One particularly problematic difference is the understanding and operationalization of key terms.

The term 'management' was originally associated to the field of economics and business but has gradually been adopted by crisis responders as a neutral umbrella term for public, private and military actors. Management embraces coordination, collaboration, command & control, leadership, direction and coordination. However, different crisis management professionals associate different meanings to these terms. Some use the term 'coordination' to signify the direction of capability for a common goal, while others prefer 'command and control' to signify the same meaning. Key terms may be used by some to describe activities, while others may associate the same terms to approaches, structures or functions. This confusion over terms hampers interoperability and thus the efficiency of crisis management (e.g., Lindbom et al, 2014).

Often the response to the challenge of interoperability is to strive for standardization, of concepts, methods, principles and terminology. Examples of such efforts are: the U.S. National Incident Management System (NIMS); the NFPA 1600: Standard on

Disaster/Emergency Management and Business Continuity Programs; and the recent standard for emergency management issued by the International Organization for Standardization, ISO 22320:2011(E).

However, despite such efforts in reality crisis management differs between actors and domains. Actors seldom embrace standards fully but interpret and adapt contents to suit them, in accordance with their legislative environment, capability, core mission and culture. The reason for this slow progress of standardisation becomes more understandable when taking the aspects of culture into account.

Culture describes the learned patterns of behaviour and thought that helps groups adapt to their surroundings. According to this view culture unifies groups of people and distinguishes them from others. It is argued that since incident management almost always involves people within organisations the concept of organisational culture becomes important. The NATO report on intercultural factors (NATO, 2008) refers to Schein (1984) who defines organisational culture as follows:

Organizational Culture is the pattern of basic assumptions that a given group has invented, discovered or developed in learning to cope with its problems of external adaptation and internal integration and that have worked well enough to be considered valid and therefore to be taught to new members as the correct way to perceive, think, and feel in relation to those problems (Schein, 1984:4).

Culture also divides actors in terms of views on what constitutes good practice and appropriate ethics in crisis management. This has been a key issue in military coalition efforts and the military community has subsequently made a considerable effort to increase the knowledge on culture (NATO, 2008).

The perspective behind the proposed model is to view cultural heterogeneity in a crisis as an asset rather than a liability. The view is that each actor's culture is a functional result of adapting to the actors' particular role, challenges and capability. In order to allow the full exploitation of this culture a common model for multi-actor command and collaboration should complement the actor's mental models (Lundh et al., 1992) rather than replace them. From the actor's perspective the common model constitutes a second language for command and collaboration, to be used in multi-actor context.

This second language is linked to a systems perspective.

Systems perspective

First, all crises should be considered from a complexity perspective. Crisis management typically involves a wide range of actors from all levels and functions in society. Side by side you may find community care, rescue, medical care, policing, infrastructure operators, the military and government representation. International assistance may also be present. These actors do not appear on, and disappear from, the scene at once but gradually. In addition these actors have an internal dynamic which is added to the dynamic of the crisis itself. This affects interactions and thus the collective output of crisis management. However, actors tend to

persistently engage mainly with pre-identified actors and then tend to focus on professional responders. An often-ignored fact is the self-healing ability of society itself. Numerous disasters show that most lives are saved by the local population – family, friends and people who just happen to be there – rather than public responders who typically arrive at the scene after a time lag.

While this is well known and theoretically explained by e.g. trust and social identity theory, it is nevertheless as persistent feature which sub-optimizes available capability on the scene by shadowing unknown and emergent actors, such as the local society as first responders. The response to this is to apply a systems perspective.

Applying a systems perspective allows taking into account not only the components but also the relations between the components, as well as deal with complexity, i.e. realizing that the behavior of a system as whole cannot be explained by analyzing the behavior of its parts. The proposed model divides the crisis in an outer system and an inner system, both defined by the observer's perspective. The affected part of society⁵ constitutes the outer system and the responding actors constitute the inner system, in which society's self-healing ability is recognized (Figure 2).⁶



Figure 2. The inner and the outer system

The argument for dealing with needs and effects in both the inner and outer system is because it is not possible to evaluate the quality of the functions command and collaboration based on the end result in the field. These results say little about whether the functions' output is good or bad. Good command and collaboration, or even good direction and coordination, may not

⁵ The agent behind may be an opponent, such as terrorism or a warring faction, or natural event such as torrent rain, draught or a tsunami

⁶ It is of course possible to consider a response in which the responding organization is alone on the scene. The inner system then becomes the organization itself. However, this corresponds with traditional and thoroughly addressed theories and practices on C2 and management and will not be dealt with here.

result in any positive effects in the outer system due to friction. The opposite is also possible; really bad command and collaboration may nevertheless be followed by excellent effects in the field; the wind may change and quell a wild fire, or an opponent may run out of supplies. You may simply get lucky. Thus it is necessary to monitor needs and effects in both the inner and the outer system, in order to have a basis for formulating goals and effect. This in turn allows you to determine whether your efforts have been successful or not.

Relating this to the observer's perspective allows tailoring the systems analysis to the observer's role and tasks. Subsequently, for a given crisis in a given point in time, the inner and outer system defined by e.g. the national and strategic perspective will be different compared to the systems defined by e.g. the local tactical perspective.

Needs and effects

First, there is widespread tendency in crisis management to describe the crisis situation in general instead of identifying needs. Second, crisis management often focuses heavily on internal dynamics, to the cost of focusing on the root cause of the crisis. This is a behavior which seems to increase with pressure – the stressed organization becomes overly introvert. The single organization has to monitor the crisis – the outer system- in order to identify what needs to be done and then make that happen. The organization also has to monitor itself in order to create the internal focus and harmony necessary for coherent action in the outer system. This is what Berndt Brehmer refers to as the Janus-face of command and control (Brehmer, 2014). In the multi-actor context this becomes an even greater challenge, since the aggregate of actors have to create focus and harmony also across organizational borders – the inner system.

This means that the individual will deal with three dimensions – the own organization, the aggregate of responding organizations and the affected part of society. The response to this is to create a model which focuses on needs and effects, a view which is similar to the approach of effects-based operations (Smith, 2003). Linked to the division between an inner and an outer system this means that there are both inner and outer needs, as well as inner and outer effects. We begin with the outer system.

The outer system need is to be restored to its pre-crisis state or better. The effects to be created are those system changes required to restore it. These effects are realized by appropriate field activities which in turn constitute the collective response. Turning to the inner system, the need here is to transform capability into effective action. This requires direction and coordination, which constitutes the effects to be created in the inner system. These effects are realized by the inner system's functions command or collaboration. The definition of these four terms (in italics) will be returned to later.

Mandate and agreement

In addition to differences there are also commonalities across organizational cultures which are bad for dealing with crises. Crisis management in general tends to focus on mandates and view them as necessary and absolute. According to this view, mandates are necessary for two

reasons; first to ensure that formulated goals are mirrored in action and second; to assure legality for the actions. Mandates are viewed as absolute in the sense that a mandate always allows sanctions if actions do not mirror formulated goals. In other words, you either have a mandate or you don't, there is nothing in between.

This view may be appropriate in single actor contexts and especially in military organizations, but not in the multi-actor civil-military crisis response. Instead, actors are often hierarchical equals where no actor carries a mandate to dictate the collective way forward. To the extent that there are overarching legal provisions for a single actor to lead, these provisions are likely to be open for interpretation and seldom allow sanctions.⁷ We instead view mandates as differing in strength, in the sense that they allow varying degrees of interpretations and sanctions – mandates may be strong or weak. To this is added the concept of legitimacy. While mandates may give legality to goals and actions, this does not necessarily mean that the very same goals are seen as legitimate.

Legitimacy, “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values and definitions” (Suchman, 1995:574), brings more influence. Ideally any given goal or action should be associated with legality as well as legitimacy, but as mandates weaken, the importance of legitimacy increases. The end result is a capital of authority.

Importantly, legitimacy may also provide leverage even when no mandate (legal basis) exists. This links to network dynamics related to trust between individuals, organizations and informal structures (Atkinson and Moffat, 2006). This in turn determines how well single actors may influence a collaborative context where no formal inter-organizational mandates exist. Together, these and other factors may persuade the collective of actors to agree to allow one of their peers to take a leading role in a specific question on time period if deemed necessary. Also this is seen as an authority base for command. As a result, the proposed model allows for the command to be based on legitimacy as well as on mandate (legality).

It is important to note that this paper does not advocate this option, nor does it advise against it. However, it may be noted that command based on legitimacy or trust is as fragile as the nature of the agreement base is based on perception and thus fleeting. In other words, the system influence disappears the very same moment that its capital legitimacy disappears, which can happen instantly. Nevertheless evidence from practice shows that such influences exist, which motivates incorporating them in a theoretical model.

Interrelated core definitions

So far the argument has established a systems perspective in which command and collaboration are described as functions, where command is based on authority and collaboration is based on agreement. Both functions produce direction and coordination which are effects in the inner system. Direction and coordination are necessary to turn

⁷ For the Swedish context this is evident in the Governmental instructions for the Swedish Civil Contingency Agency and the 21 county administrative boards; *Förordning (2008:1002) med instruktion för Myndigheten för samhällsskydd och beredskap*, and *Förordning (2007:825) med länsstyrelseinstruktion*

capability into effects in the outer system. Direction concerns orienting available capability towards formulated goals. Coordination concerns adjustment of actions and sub-goals so that available capability is used effectively.

Defining the four terms direction, coordination, command and collaboration by turning to literature appears difficult. While there are multiple definitions available, to our knowledge there is no operationally useful and interrelated set of definitions for the four core terms. For the military domain, Pigeau and McCann express this as “definitions themselves are circular and redundant. The command definition makes use of the word control, the control definition uses concepts that are part of the definition of command, and the definition of C2 is merely a longer restatement of the definition of control” (Pigeau and McCann, 2002:53). This motivates creating a set of definitions starting with a clean sheet⁸ and aiming for a set which is operationally useful. This in turn requires a conscious approach to goals and centers of gravity.

In the multi-actor context there are multiple goals but also multiple centers of gravity, since each actor has its own role and therefore identifies the needs and effects relevant for fulfilling that role. The aggregate of these needs and effects in a particular crisis constitute a totality. It is this totality towards which available capability is to be directed through the formulated goals. It is also this totality in which efforts are to be coordinated by adjusting sub-goals and activities. Simply put, the capability to help each other where they can, and avoid being in each other’s way. Based on the above, these core terms may be defined as follows (Figure 3):

Function	Effect
<i>Command</i> – function which produces direction and coordination based on the authority of a single actor	<i>Direction</i> – orientation of available capability towards formulated goals
<i>Collaboration</i> - function which produces direction and coordination based on agreement between actors	<i>Coordination</i> – adjustment of actions and sub-goals so that available capability is used effectively

Figure 3. Definitions of core terms

To recap, in the previous pages we have argued that the practitioner benefits from a model which: (1) establishes a complementary rather than invasive standard; which (2) stimulates a systems perspective and a needs-effect thinking; (3) erases obsolete views on mandates, and; (4) offers an operationally useful set of interrelated definitions of core terms. We have also argued that society has a self-healing ability

Bringing it all together in one illustration results in the following (Figure 4):

⁸ Cooperation with the project “Common terminology” administered by the Swedish Ministry of Health and engaging the Swedish Centre for Terminology (Terminologikum, TNC)

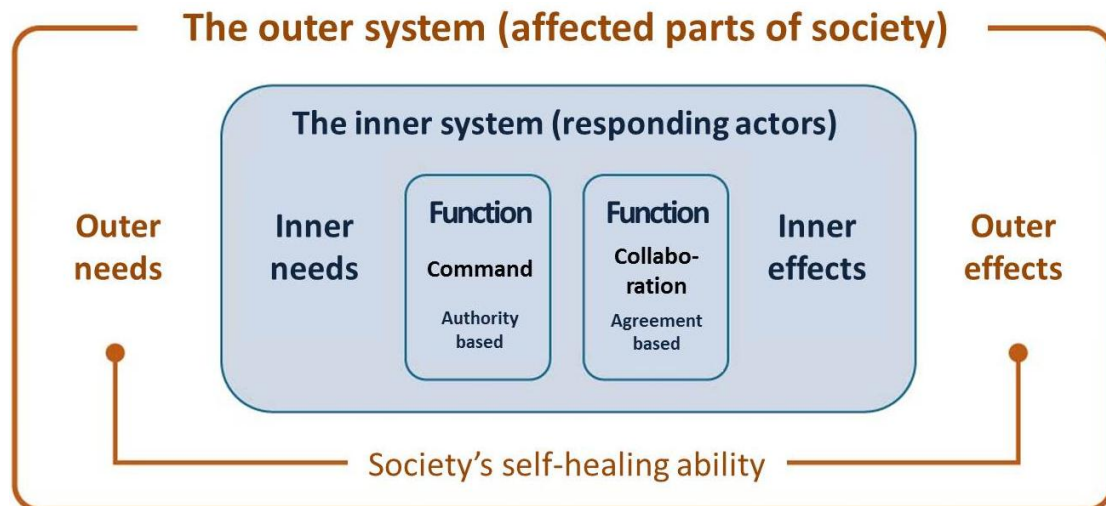


Figure 4. The global model for direction and coordination in multi-actor crisis management

Discussion

In this paper we propose a model which aims to help the practitioner deal with crises. The purpose of the model is to influence how actors think about command, collaboration, direction and coordination across organizational boundaries. The model exploits design logic according to Jensen (2010) and Brehmer (2014). Many of the model components are borrowed from previous work, such as the approach of effects-based operations (Smith, 2003). However, there are some differences worth noting.

Inner and outer system

One of the differences between the proposed model and previous writings of Brehmer (2008; 2007; 2014) and Jensen (2010) concerns the application of functions and systems. Here we discuss functions which produce direction and coordination, rather than systems⁹. We also let the inner system embrace the capability available for realizing effects in the outer system, rather than describing them as an interface between the inner and the outer system. This is inspired by the views expressed by Pigeau and McCann (2002), and reflected in Alberts and Hayes (2003), that not only commanders command but that command may stem from any individual, or emerge spontaneously.

In other words, the functions of command and collaboration may be realized not only in pre-identified structures for command and collaboration, but also in the capability available for creating the desired effects in the outer system. This also reflects the view that direction and coordination may be created bottom-up as well as top-down. With this perspective it becomes logical to let the inner system also embrace the capability available to, and within, the crisis management collective of actors.

⁹ Brehmer and Jensen talks about the C2 system and the functions needed to realize the C2 purpose, namely produce direction and coordination

Self-synchronization

It should be noted that the view of command and collaboration as functions does not limit how these functions are realized. The previous paragraph made it clear that, according to this perspective, these functions may manifest themselves anywhere in the inner system and thus not only limited to pre-identified structures for command and collaboration. In addition, this perspective recognizes that realizing these functions may not even require dedicated efforts but may be realized through self-synchronization, as demonstrated by Brehmer (2009)¹⁰. However, for this to be possible there are probably some requirements which need to be fulfilled. Alberts and Hayes (2003:27), implicitly referring to the single organization, note four assumptions for self-synchronization;

- Clear and consistent understanding of command intent;
- High quality information and shared situational awareness;
- Competence at all levels of the force; and
- Trust in the information, subordinates, superiors, peers and equipment.

To the extent that these assumptions are valid, the question becomes if they are possible to be translated into, and realized in, the multi-actor context characterized by: complex dynamics, multiple centers of gravity, mandates of varying strength (if they exist at all) and different cultures. While this may appear pessimistic the proposed model does not exclude the possibility of self-synchronization also in multiple-actor crisis management.

Translating to practical use

The model, and the arguments behind it, is the results of a two-year project administered by the Swedish Contingency Agency 2012-2014. One of the central aspects of the model is that it is, in design logic terms, anchored on the function level rather than the form level. In other words, the model describes what is produced, but not how this is done. The reason for this is the great variety of contexts to which the model must apply and for which it would be impossible to describe all practical variants of command and collaboration. The idea is that the function model should work as a tool for the practitioner to translate its philosophy to the form level; mandates, organizations, roles, methods and supporting systems (Brehmer, 2014).

This model has passed through a considerable vetting process; first within the project organization, then within the Swedish Civil Contingency Agency and finally circulated to more than one hundred Swedish public, private and volunteer actors. The model is currently undergoing implementation. While it is too early to draw conclusions from the implementation, the general impression is that this might prove to be a challenge in the dialogue with crisis management practitioners, not because the model is not accepted but because the translation process may turn out to strain capability too much.

¹⁰ Brehmer (2009) showed in experiments that self synchronization is possible and that under time pressure is more effective than traditional forms of hierarchical command, and that free communication in a network is beneficial.

The translation process requires, first, a basic understanding of the related theories¹¹ and second, a comprehensive analysis of the own organization from these new perspectives. As it turns out, with today's slimmed capability actors seldom have the time necessary to spend on such a process although fundamentally positive to the idea. The end result is repeated calls for descriptions on the form level. Simply put, practitioners would rather have ready-made checklists. How to deal with this may be a suitable area for future research.

Finally, is highly important to remember that the model – as any model – is a simplification of reality. As such it may lure the practitioner into viewing reality as equally simple rather than a large and complex system. Thus the model needs to be used with caution, constantly recalling that the environment is, in fact, not simple at all.

References

- Alberts, D.S., and Hayes, R.E. (2003): *Power to the Edge. Command...Control...in the Information Age*, Washington, DC: CCRP Publication Series
- Atkinson, S.R., and Moffat, J. (2006): *The Agile Organization – From Informal Networks to Complex Effects and Agility*, US DoD Command and Control Research Program, <http://www.dodccrp.org>, 2006
- Brehmer, B. (2007): Understanding the functions of C2 is the key to progress, *International C2 Journal*, CCRP, Vol. 1, No. 1 http://www.dodccrp.org/html4/journal_v1n1_07.html, accessed 2015-02-10)
- Brehmer, B. (2009): *Command without Commanders*, 14th ICCRTS
- Brehmer, B. (2014): *Insatsledning*, Swedish Defence University, Stockholm
- Jensen, E. (2010): *Mission Design: Fitting the Solution to the Problem*, 15th ICCRTS
- Lindbom, H., Tehler, H., Eriksson, K. and Aven, T. (2014): The capability concept – On how to define and describe capability in relation to risk, vulnerability and resilience, in *Reliability Engineering and Systems Safety*, Vol. 135, pp. 45-54
- Lundh, Montgomery and Waern (1992): *Kognitiv psykologi*, Studentlitteratur, Lund
- NATO (2008): *Multinational Military Operations and Intercultural Factors*, TR-HFM-120, Neuilly-Sur-Seine CEDEX, France
- Pigeau, R., and McCann, C. (2002): Re-conceptualizing Command and Control, in *Canadian Military Journal*. Vol 3, No 1
- Rasmussen, J. (1985): The role of hierarchical knowledge representation in decisionmaking and system management. *IEEE Transactions on Systems, Man and Cybernetics*, SMC-15 2: 234–243.

¹¹ Design logic, systems theory, legality versus legitimacy etc.

Schein, E.H. (1984): *Coming to a new awareness of organizational culture*. Sloan Management Review, vol. 19

Smith, E. A. (2003): *Effects Based Operations: Applying Network Centric Warfare in Peace, Crisis, and War*. Washington DC: CCRP

Simon, H. A. (1996): *The Sciences of the Artificial* (3rd ed.). Cambridge, MA: MIT Press

Suchman, M. C. (1995): Managing Legitimacy: Strategic and Institutional Approaches, in *The Academy of Management Review*, Vol. 20, No. 3, pp. 571-610

Uhr, C. (2009): *Multiorganizational Emergency Response Management: Framework for Further Development*. Dissertation No. 1041, Lund University