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Abstract

This thesis explores the conditions to improve collaborative behaviour between organizations in crisis response management. It takes an explorative approach and begins by identifying several challenges to interorganizational collaboration. A systematic review of the international scientific literature in conjunction with semi-structured interviews with crisis management professionals in civil-military collaboration context identified several challenges and their underlying reasons. Indications on ways to minimize such challenges are also explored. Based on these indications, two factors are chosen that are tested with the help of experiments involving 111 crisis management professionals from the Swedish police force, fire and rescue services, defense forces and the Civil Contingencies Agency (MSB). The experiments were performed to test whether changing the degree of these factors can potentially influence collaborative behaviour. Findings of the study indicate that by changing familiarity and expectation of future cooperation the extent of utilizing resources and the extent of contributing resources can be influenced. With greater degree of familiarity and long term commitment between organizations, greater knowledge on capabilities and equipment of other actors in crisis response, there is a higher extent of utilization of resources from other organizations in a joint task. Similarly higher degree of familiarity and long term commitment also make organizations to be more willing to contribute in terms of resources, equipment, knowledge and capabilities in a joint task. This means by fostering higher degree of familiarity and long term commitment, organizations are expected to share, allocate and mobilize resources between them more effectively. Since this most likely will contribute to improve overall collaborative efforts in crisis response management, steps to increase familiarity and long term commitments between organizations seem to be a promising strategy to improve interorganizational collaboration. The thesis also discusses how increased familiarity and long term commitments may also help organizations to adapt to changed conditions that arise during crises. The thesis has implications for crisis planning, preparedness and overall improvements of collaborative efforts in crisis response management.
Interorganizational Collaboration In Crisis Response Management

Exploring The Conditions For Improving Collaborative Behaviour Across Organizational Borders

Roshni Pramanik

LICENTIATE THESIS

Academic thesis by due permission of the Faculty of Engineering at Lund University, Sweden, for the degree of Licentiate in Engineering.

To be publicly defended at E Huset, Room no: 1406, Ole Römers väg 3, Lund.
On Thursday, 26 November, 2015 at 10.15 CET.

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This thesis explores the conditions to improve collaborative behaviour between organizations in crisis response management. It takes an explorative approach and begins by identifying several challenges to interorganizational collaboration. A systematic review of the international scientific literature in conjunction with semi-structured interviews with crisis management professionals in civil-military collaboration context identified several challenges and their underlying reasons. Indications on ways to minimize such challenges are also explored. Based on these indications, two factors are chosen that are tested with the help of experiments involving 111 crisis management professionals from the Swedish police force, fire and rescue services, defense forces and the Civil Contingencies Agency (MSB). The experiments were performed to test whether changing the degree of these factors can potentially influence collaborative behaviour. Findings of the study indicate that by changing familiarity and expectation of future cooperation the extent of utilizing resources and the extent of contributing resources can be influenced. With greater degree of familiarity and long term commitment between organizations, greater knowledge on capabilities and equipment of other actors in crisis response, there is a higher extent of utilization of resources from other organizations in a joint task. Similarly higher degree of familiarity and long term commitment also make organizations to be more willing to contribute in terms of resources, equipment, knowledge and capabilities in a joint task. This means by fostering higher degree of familiarity and long term commitment, organizations are expected to share, allocate and mobilize resources between them more effectively. Since this most likely will contribute to improve overall collaborative efforts in crisis response management, steps to increase familiarity and long term commitments may also help organizations to adapt to changed conditions that arise during crises. The thesis has implications for crisis planning, preparedness and overall improvements of collaborative efforts in crisis response management.

Keywords: interorganizational organizational collaboration, crisis response management, collaborative behaviour, organizational adaptation.
Interorganizational Collaboration In Crisis Response Management

Exploring The Conditions For Improving Collaborative Behaviour Across Organizational Borders

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Dedication

In loving memory of my dearest Father who continues to be with me, inspiring me relentlessly in all my endeavours, despite his mortal absence…
Summary

The twenty first century has witnessed many major crises, such as Hurricane Katrina, the events of 9/11, the Indian Ocean tsunami, the H1N1 pandemic, the global financial meltdown, etc. A common factor in these crises is that their effects are not localized. Modern-day crises are often termed ‘transboundary’ because their impact is felt across national borders, stakeholder organizations, sectors, economies, cultures and societies. Their interconnectedness and complexity necessitate interorganizational collaboration, but achieving it has been difficult. Furthermore, a notable feature of a crisis is that the external environment changes unexpectedly. These conditions require organizations to make structural or functional changes.

Interorganizational collaboration in crisis management requires the pooling and mobilization of resources, and harmonized functions across various domains in different organizations. When this is effective, it helps the organizations to adapt to the changed conditions created by a crisis. Collaborative efforts will most likely improve the response to a crisis. It creates an openness between organizations that helps them to work together in joint tasks and assume new roles, tasks, functions and leadership. Overall, it seems to provide a promising basis for effective crisis response management.

This thesis explores the conditions that facilitate interorganizational collaboration in crisis response management, which may help organizations to adapt to the changes in their external environment created by crises. It addresses three main issues.

First, it identifies several challenges to interorganizational collaboration in the context of crisis response management. A systematic review of the international scientific literature covering various collaboration contexts in crisis response, together with semi-structured interviews with professionals in civil-military collaboration context identified several challenges that were categorized into five themes. Reasons behind these underlying challenges are also explored. This knowledge helps us to understand the challenges to interorganizational collaboration better and suggests ways how they can be minimized.
Second, it identifies two factors that potentially influence collaborative behaviour, namely familiarity and long term commitment. Experiments were conducted with crisis management professionals from the Swedish police force, fire and rescue services, defence forces and the Civil Contingencies Agency (MSB) to test whether these factors influenced collaborative behaviour. The experiments demonstrated that a greater degree of familiarity and long term commitment resulted in better resource sharing, mobilization and allocation between organizations. With greater degree of familiarity and long term commitment between organizations, greater knowledge on capabilities and equipment of other actors in crisis response, there is a higher extent of utilization of resources from other organizations in a joint task. Similarly higher degree of familiarity and long term commitment also make organizations to be more willing to contribute in terms of resources, equipment, knowledge and capabilities in a joint task. This means by fostering higher degree of familiarity and long term commitment, organizations are expected to share, allocate and mobilize resources between them more effectively.

Finally, the thesis discusses how the conditions that facilitate interorganizational collaboration may also improve the ability of organizations to adapt to the changed conditions that arise during crises. For example, fostering familiarity, trust and long term commitment between organizations may encourage them to work with each other, pool resources and harmonize actions. In turn, this may help organizations to assume new tasks, roles, functions and provide leadership in various functional domains, or to make structural or functional changes. Thus these findings have implications for crisis planning, preparedness and overall improvements to crisis response management by suggesting ways to improve the adaptive ability of organizations and facilitate collaborative behaviour across organizational borders.
Tjugohundratallet har bevittnat flertalet stora kriser, såsom orkanen Katrina, terrordåden den elfte september, tsunamin i Indiska Oceanen, H1N1-pandemin, finanskraschen med mera. En gemensam nämnare i nämnda kriser är att konsekvenserna ofta kan påverka stora geografiska områden, och att de kan spridas mellan olika sektorer i samhället. Moderna kriser benämns därför ofta som gränsöverskridande, både med avseende på geografiska gränser och funktionella gränser. En viktig orsak till att konsekvenserna kan spridas är den allt tätare sammankopplingen mellan olika sektorer i samhället, vilket leder till starka beroenden och därmed underlättar snabb spridning av konsekvenserna från en kris. För att hantera kriser i en sådan miljö krävs vanligtvis omfattande samarbete mellan olika organisationer. Men, att åstadkomma det har visat sig vara svårt.

Då flera organisationer skall samarbeta vid hanteringen av en kris krävs ofta att de är villiga till både strukturella och funktionella anpassningar. Organisationerna måste alltså vara villiga att både ändra den organisatoriska strukturen, men också att ibland genomföra helt nya uppgifter. Lyckas man med detta och är framgångsrik i att utnyttja den potential som finns inom samtliga organisationer som deltar vid hanteringen av en kris finns goda möjligheter att åstadkomma en effektiv hantering av själva krisen.


Två faktorer som förefaller vara viktiga för huruvida två organisationer samarbetar framgångsrikt vid en kris är (1) huruvida de personer som hanterar
krisen känner till den organisation som man skall samarbeta med (eng. familiarity), och (2) huruvida de personer som hanterar krisen upplever att det finns ett långsiktigt engagemang i samarbetet mellan organisationerna (eng. expectation of cooperative future interaction, ECFI). Hur variation med avseende på dessa faktorer påverkar möjligheten till samarbete mellan två organisationer i en kris undersöktes genom två experiment. Experimenten utfördes med yrkesverksamma från Polisen, räddningstjänster, försvaret och Myndigheten för Samhällsskydd och Beredskap (MSB). Båda experimenten handlade om att försökspersonerna skulle fatta beslut rörande användning av olika typer av resurser i en gemensam krishanteringsinsats där två organisationer deltog (den egna organisationen och en annan).

Experimenten visade att en högre grad av kunskap om den andra organisationen (familiarity) och en högre grad av långsiktiga åtagande mellan organisationerna (ECFI) resulterade i mer omfattande utbyte av resurser mellan organisationerna. Mer specifikt, resultaten visar att försöksdeltagarna var mer benägna att använda resurser från andra organisationer vid en krishanteringsinsats då de hade goda kunskaper om den andra organisationen och då de förväntade sig framtida samarbete med den. Vidare visar intervju och enkätsvarat att deltagarna vid experimenten betraktar de två faktorerna (familiarity och ECFI) som viktiga för hur mycket man bidrar till en gemensam krishanteringsinsats. Resultaten från experimenten visar dock i viss utsträckning motsatt förhållande. Hög grad av kunskap om den andra organisationen (familiarity) leder till att man bidrar med mindre resurser till den gemensamma krishanteringsuppgiften. Detta resultat kan dock förklaras av att deltagarna då litar mer på att den andra organisationen klarar att genomföra den gemensamma uppgiften med mindre bidrag från den egna organisationen.

Slutligen diskuterar uppsatsen hur förhållanden som underlättar interorganisatoriskt samarbete också kan förbättra organisationens förmåga att anpassa sig till nya förhållanden som uppstår under kriser. Till exempel, hur främjandet av kunskap om andra organisationer, tillit och långsiktiga åtaganden mellan organisationer kan leda till att organisationerna arbetar mer tillsammans, slår samman resurser och harmoniserar åtgärder. Det kan i sin tur hjälpa organisationer att ta sig an nya uppgifter, nya funktioner, anta nya roller, tillhandahålla ledarskap inom olika verksamhetsområden eller göra strukturella och funktionella ändringar. Således har dessa nya rön implikationer för krisplanering, beredskap och övergripande förbättringar av krishantering genom att föreslå sätt att förbättra organisationers anpassningsförmåga och underlätta samarbetsförmågan över organisatoriska gränser.
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My deepest thanks to my Mother. Her constant support has brought me where I am. Her courage and strength inspires me. Love to my Brother for his support and those amazing moments of laughter. Love to my dear husband Jishnu, he moved all the way
from India to Europe to be with me. Thank you for being extremely patient, for believing in me and giving me strength throughout! Love you all so dearly!

Finally, a thank you note to my Father will never be enough. My memories of him have always lifted me up just as he would, if he would be with me. Father, I hope wherever you are, you will be happy to see me reaching this milestone. Without you, life is and shall always be incomplete.

I miss you Father.

Thank you all!

Roshni Pramanik
Lund, September 30, 2015.
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List of Abbreviations

ECFI: Expectation of future cooperation

EOC: Extent of Contribution

SIT: Social Identity Theory

EU: European Union

UN: United Nations

NATO: North Atlantic Treaty Organization

MSB: Myndigheten för samhällsskydd och beredskap - Swedish Civil Contingencies Agency

PRISMA: Preferred Reporting Items for Systematic reviews and Meta-Analyses
List of Appended Publications

Paper I


The author of this thesis was the only author of this paper.

Paper II


The author of this thesis designed and conducted the experiment. The author played an active role in writing the paper and a moderate role in performing the statistical treatment of the data.

Paper III


The author of this thesis designed and conducted the experiment. The author played an active role in writing the paper and a moderate role in performing the statistical treatment of the data.

Related publication

Chapter 1 Introduction

The world around us in the twenty first century has become highly interdependent and interrelated in terms of economic and social processes. This is due to the effect of industrialization and modernization. Almost every sector is dependent on another, so much so that the cultural and political processes have also been influenced by this interconnectedness and interdependency (Inkeles, 1975; Hart et al., 2001).

Industrialization and modernization have undoubtedly contributed to growth of economies. This growth is associated with higher division of labour, increased mechanization and differentiation. However, this high division of labour aimed to maximize growth across economies have not only made the processes increasingly differentiated but also interconnected. For example, the financial recession in the United States, popularly known as the great recession or bailout of United States in the years between 2005-2012, not only affected industries in North America but major economies all around the world (Geiger et al., 2005; Jacobsen & Mather, 2011; The Economist, September 7, 2013). Another example is the improved efficiency achieved due to the interconnectedness of critical infrastructure systems of modern society such as water and electricity supply, transportation and telecommunication.

However, the increased interconnectedness also means that a single failure in any of these sectors can propagate to others and influence the entire functioning of society (Hart et al., 2001; Rosenthal et al., 2001; Rosenthal & Kouzmin, 1996; Ödlund, 2010). Some examples of major crises in recent history include the H1N1 pandemic, the Indian Ocean Tsunami, Hurricane Katrina, the earthquake in Haiti, the floods in the Kashmir Valley, the terror strikes of 9/11, and the military operations in Iraq and Afghanistan (OECD, 2011). Similar to the concept of “global village” (Wellman, 1999; McLuhan & Powers, 1989; Tremblay, 2012), in which the growing networks and interdependencies across sectors in modern world not only bring the world closer but also make it closely coupled, which recreates the world in the image of a global village, the above examples of crises also reflect that the consequence of any event in our modern interconnected world is no more restricted to geographical, economic, social, cultural, organizational or political boundaries (Lalonde, 2007; Rosenthal et al., 2001; Rosenthal & Kouzmin, 1996, 1997; Hart et al., 2001).
1.1 Background & Problem

Crises and crisis management in the twenty first century are naturally characterized by the interconnectedness and interdependency of modern society and have therefore been described as being “transboundary” in nature (Ansell et al., 2010; Ödlund, 2010). In the words of scholars such as Ansell, Boin and Keller (2010, p: 195),

“Whether we talk about epidemics, energy black outs, financial crises, ice storms, oil spills or cyber terrorism- the characteristics of these crises are strikingly similar; they affect multiple jurisdictions, undermine the functioning of various policy sectors and critical infrastructures, escalate rapidly and morph along the way.”

Management of modern crises can be complex due to its interconnectedness (Lalonde, 2007). In fact interconnectedness of various sectors and organizations is one of the important reasons behind involvement of multiple stakeholder organizations in managing crises. These stakeholders may be public or private, national international or regional, voluntary or non voluntary and also from various sectors such as healthcare, defense, law and order, or corporate. Multiplicity of stakeholders with different goals, operational mandates, roles and diverse interests make the arena of crisis management challenging. Moreover it is difficult to have an overall managing authority that is in command of the entire management of crises (Rosenthal et al., 2001; Boin & Lagadec, 2000; van Santen et al., 2009). Further, even though crisis management has been studied as “a network of actors that cooperate to achieve common goals” (van Santen et al., 2007, 2009; Alberts & Hayes, 2006), evaluations of crises have shown that such cooperation among networks is difficult to attain, multiplicity of stakeholders and organizations implies diverse goals, there are often conflicts in such goals that lead to lack of collaboration among stakeholders (Rosenthal & Kouzmin, 1991; Boin, 2004; Boin & Ekergren 2009; Boin & Hart, 2007; Boin & McConell, 2007; Helsloot, 2008; van Santen et al., 2009).

Modern crises have some interesting characteristics related to their management and the challenges arising from them, which are summarized in the following paragraphs.

On the one hand the transboundary nature of modern crises requires multiplicity of stakeholder organizations to be able to effectively manage them. On the other hand this multiplicity of stakeholder organizations implies diverse goals, mandates, roles etc. which potentially leads to conflicts that represent a challenge in crisis management.

Secondly, as modern crises create conditions that manifests presence of multiple stakeholder organizations with diverse goals, given such situations, it may be difficult to have a single organization in command of the entire management of crises. Collaboration and cooperation between multiple stakeholder organizations to achieve
the overall goal of efficient management of crises is necessary. Although we do know how to attain efficiency and collaborate efforts within an organization to meet the objectives and goals set in that organization, however we know little when it involves multiple actors and organizations or when we are uncertain about who the partner actor or organization can be in management of crises (Ansell et al., 2010; van Santen et al., 2009; Tsasis, 2009). This knowledge gap can make the process of achieving collaboration between multiple stakeholder organizations challenging.

Thirdly, factors like changing nature of crises and its context are likely to determine the type of stakeholder organizations that may respond to crises and functional sectors that may be affected. Often, these stakeholder organizations lack knowledge of each other and have limited or no experience of working together. It is therefore quite likely that all these conditions prevailing in crisis response management arena, lead to a lack of common assumptions, consensus and unanimity among stakeholder organizations in managing crises which further contributes to the challenge of overall cooperation and collaboration among them (Rosenthal & Kouzmin, 1991; Hart et al., 1993; van Santen et al., 2009; Pramanik, 2015).

The final important aspect that characterizes modern crises is that, crises may lead to changes in environment that are uncertain (Dynes & Quatentelli, 1970; Gray, 1985). The sudden changes caused by crises place demands on organizations which may be unexpected. Unlike in normal conditions when different organizations belonging to different sectors may work independently of each other with diverse goals, these uncertain conditions demand organizations to work interdependently to meet the needs that may arise due to changes in environment. This means that conditions arising from crises require interdependent and collaborative functions between organizations with different capabilities in their respective functions to be able to address the changing needs. However, as already presented above, evaluations of crisis management efforts have shown lack of collaboration between actors and conflicts arising among them.

1.2 Rationale

Salience of interorganizational collaboration

Following the arguments on characteristics of modern crises, we observe that crises create conditions which necessitate collaboration primarily due to three reasons. Firstly, transboundary nature of crises pose problems that may not be possible for a single organization to handle and therefore scholars have often referred to such problems as “indivisible” for a single organization (Aldrich & Pfeffer, 1976; Gray 1985). Secondly, due to the complex nature of modern crises which create uncertain
conditions in the environment and place unexpected demands on organizations, traditional tasks or functions assumed by a single organization are likely to be insufficient to effectively respond to the changing demands that may arise (Dynes, 1970 a,b). Given such conditions, interorganizational collaboration acts as a problem solving approach between several organizations emphasizing on domain specific functions and structures, which is likely to be more efficient in managing crises (Gray, 1985; Edwards, 2009). Finally, interorganizational collaboration can reduce risk of collapse of functioning of organizations for not being able to fulfil the unexpected demands of the changed environment. Interorganizational collaboration reduces this risk with better resource mobilization and allocation, sharing capabilities and competencies across organizations (Fjeldstad et al., 2012).

On a broader level, by framing interorganizational collaboration in context of demands of the changing conditions that prevail in crises, provides us with the scope to investigate the challenges that organizations are most likely to face in crises. This knowledge and understanding of challenges can help organizations to cope with the dynamic conditions of modern crises. Further, this knowledge can also help organizations to reorganize and mobilize their structural and functional domains across their borders in an effective manner, assume new structures or functions according to the demands of the environment. This can eventually help organizations adapt. Moreover, better collaboration between organizations shall contribute to better organizing of overall crisis management efforts, thereby provide opportunities for organizations to cope with demands of the changing conditions in crises. Thus it can be argued that research exploring conditions that can facilitate interorganizational collaboration is necessary.

This thesis explores the challenges in interorganizational collaboration among multiple stakeholders in modern crisis management. It explores conditions under which collaboration between these stakeholder organizations can be enhanced. The thesis also provides some logical arguments based on its contributions on how improved conditions to collaborate can help organizations adapt better to changed conditions arising due to crises.

1.3 Thesis outline

The thesis is organized in the following manner.

Chapter 1, the introduction to this thesis as we already observed presented the background, research problem and the rationale. Section 1.4 in Chapter 1 shall contain a list of the scientific papers appended in this thesis. Chapter 2 presents the objective of this thesis and the more specific research questions outlined in the thesis
that the appended papers are set to address. Chapter 3 presents the theoretical framework that the thesis is inspired from and that help answering the research questions. Several research methods and materials used in the papers appended in this thesis are presented in chapter 4. Chapter 5 presents how each of the appended papers in this thesis address the overall research questions and objective of this thesis, summarizing the research contributions. This is followed by the discussions and limitations of this thesis in chapter 6. Avenues for future research are also discussed in this chapter. Finally, chapter 7 lists the conclusions.

1.4 Scientific publications and author contributions

This thesis is a compilation of three scientific publications, submitted to international peer reviewed journals. Till date, two of the scientific papers have been published and one is under review. The papers are listed below.

Appended papers

Paper I

The author of this thesis was the only author of this paper.

Paper II

The author of this thesis designed and conducted the experiment. The author played an active role in writing the paper and a moderate role in performing the statistical treatment of the data.
Paper III


The author of this thesis designed and conducted the experiment. The author played an active role in writing the paper and a moderate role in performing the statistical treatment of the data.

Related publication

Chapter 2 Research Objective & Questions

2.1 Research Objective

From the research problem and rationale presented in chapter 1, the overall objective of the thesis outlined is as follows:

To contribute to better understanding of the challenges associated with crisis management that involve collaboration between multiple organizations and to explore how the ability of organizations to collaborate across their borders in managing a crisis can be improved.

In order to fulfill the research objective, specific research questions were formulated. These questions are addressed in the appended papers, Papers I, II and III. The list of appended papers and related publication was already presented in chapter 1, section, 1.4. The rationale behind each paper as a research activity can be best understood in relation to the research process. Section 4.1 in chapter 4 presents more details on research process. The papers are presented in the order the studies were developed or carried out.

2.2 Research Questions

The first research question was formulated in a way that it offered a point of departure for the research process and therefore broad in its scope.

1. What are the challenges to interorganizational collaboration in crisis response management?

The question formulated above is quite broad in its scope. There can be numerous challenges to interorganizational collaboration and it is unlikely that any study can claim to be so comprehensive to list every possible challenge that exists in interorganizational collaboration. Therefore in an effort to limit this study, a systematic review of international scientific literature was conducted in Paper I to be able to explore the challenges related to interorganizational collaboration in context of
crisis response management listed in the scientific literature. This literature review enabled to explore several types of challenges in interorganizational collaboration in crisis response management which could be classified under broad themes.

To complement the findings from the systematic review scientific literature, semi-structured interviews focusing on the perceptions of professionals involved in crisis management activities was also carried out. These interviews were limited to civil-military collaboration in crisis management contexts. Thus, there are professionals belonging to several other organizations who could be involved in crisis response, however were not included as interviewees in this case (for example officers from the police, fire and rescue services or public health services and ambulance services). Nevertheless, the civil-military collaboration context was consciously chosen as it was expected that such a context would reveal many of the challenges encountered in other contexts as well. As civil and military organizations are very different from each other in terms of their tasks or functions, there is higher likelihood of being able to explore challenges to interorganizational collaboration between these two types of organizations in particular. Therefore in this case, semi-structured interviews with a specialized focus on professionals belonging to civil and military organizations can be claimed to be a good choice.

From the findings of Paper I, several factors that might inhibit or facilitate interorganizational collaboration were identified. Some of these factors appeared easier to be influenced in practice than others (For example, socialization, building formal/informal contacts, getting “to know”, refer to Table 1 in Paper I for details). As the overall objective of the thesis underlines exploring conditions that can improve interorganizational collaboration in crisis response management therefore aspects that are easier to be influenced, modified or impacted upon were selected for further study. The two factors that were selected for further study are called familiarity and expectation of future cooperation.

Furthermore, the review of international scientific literature and the semi-structured interviews provided a list of factors that facilitated or inhibited interorganizational collaboration. This list gave indications towards two factors in specific, namely familiarity and expectation of future cooperation that appeared particularly relevant and could be potentially influenced. Both these factors were previously been investigated in the scientific literature. In a crisis response management context, the research conducted on familiarity and expectation of future cooperation have been focussed on qualitative approaches such as interviews. However, due to the qualitative nature of the research it is difficult to assess the extent to which changing the two factors, through a type of intervention, would lead to improvement in collaboration. Moreover, it is difficult to study real events of crisis response as they are influenced by several external factors. Experiments in controlled conditions that mirror such real events offer the scope to investigate the factors that one is interested in and lower the
potential risk of external factors having influenced the results. Therefore in this thesis, a quantitative approach to investigate the effects of changing these independent variables, namely familiarity and expectation of future cooperation was chosen in controlled experimental conditions. The quantitative approach in controlled experiments was also complemented with qualitative surveys.

Resource mobilization is one of the major aspects of collaboration and therefore effective sharing of resources between organizations is necessary for effective collaboration. Considering the relevance of effective sharing of resources and equipment between organizations in crisis response management context, the effects of changing familiarity and expectation of future cooperation are investigated in this thesis. The changes in familiarity and expectation of future cooperation are tested with respect to firstly, the extent to which crisis management professionals utilize resources from other organizations and secondly the extent to which crisis management professionals contribute resources from their own organizations. This brings us to the second and third research questions for this thesis.

2. Do change in familiarity and expectation of future cooperation influence the extent to which crisis management professionals utilize resources from other organizations in a joint task?

3. Do change in familiarity and expectation of future cooperation influence the extent to which crisis management professionals contribute resources to other organizations in a joint task?

In Chapter 4, section 4.1, a description of how the above research questions formulated in this thesis guided the research process is presented.
Chapter 3 Theoretical Framework

This chapter describes the main theoretical concepts used in the thesis, which are inspired from several disciplines. It begins by presenting definitions of collaboration and coordination in the context of crisis response management. Next it presents the concept of adaptation in organizations. Illustrative examples from recent crises are provided to help understanding these theoretical concepts and their connection with interorganizational collaboration. Finally the chapter presents the social identity theory and its relevance in this thesis.

3.1 Defining interorganizational collaboration

The concepts of collaboration and coordination have been used interchangeably in theory and practice due to their conceptual overlaps. The section begins by presenting several definitions of coordination and collaboration that have been used in the field of crisis management and related disciplines and the conceptual overlaps. Next, the definition of interorganizational collaboration used in this thesis is presented.

Coordination has been defined in different ways. Quarentelli (1997, p. 48) describes it as “mutually agreed upon cooperation about how to carry out particular tasks”. According to Drabek & McEntire (2002, p. 199) it is “a collaborative process through which multiple organizations interact to achieve common objectives”. McEntire (2007, p.291) describes it as “the harmonization of activities among diverse actors”. It has also been defined as “the extent to which organizations attempt to ensure that their activities take into account those of other organizations” (Hall et al., 1977, 459). The above definitions demonstrate an important aspect of coordination namely the harmonization of activities of different organizations and their mutual adjustment of different activities with respect to other actors.

Collaboration has also been explained in various ways. For example, Gray (1989) posits, it is a type of interorganizational relationship where partners work towards a common goal. Several researchers explain it as a process that involves different activities for example information sharing, development, outreach, policy changes within and across sectors with varying levels of complexity. They argue that it can be
studied from various perspectives (O'leary & Vij, 2012; O'leary et al., 2015; Mitchell et al., 2015). It has also been explained as an activity that spans boundaries between organizations to manage interactions and interdependencies (Tsasis, 2009), or as a phenomenon that involves substantial interaction between organizations on a number of fronts. This finds particular significance in crisis response and recovery as demonstrated in the studies conducted on response and recovery efforts to Hurricane Katrina, World Trade Center Attacks and the Indian Ocean tsunami (Comfort & Kapucu, 2006; Butts et al., 2012; Raju & Becker, 2013). All of these studies identified the crucial need for collaboration in order to coordinate activities between government authorities and other stakeholder organizations. The main point that emerges from these definitions is that, collaboration is a process that involves harmonizing of activities that span boundaries between organizations. The process manages interdependencies and helps to address the complexity of needs that may arise during crisis response and recovery. These activities can be of various nature. They are primarily directed towards establishing effective resource sharing and mobilization, communication, sharing technology, knowledge, information etc. between organizations. They enable organizations to be able to complement their capabilities in situations characterized by a crisis where it is not possible for a single organization to be able to fulfil the needs demanded by the external environment. Since these activities span the boundaries between organizations and are directed mainly to manage interdependencies they are often referred to as boundary spanning activities (See Aldrich & Herker, 1977; Leifer & Delbecq, 1978).

The above definitions of coordination and collaboration also demonstrate conceptual overlaps between them. Coordination and collaboration have been used interchangeably not only in research but also in practice (See for example Gray 1989; Alexander, 1995; Drabek & McEntire, 2002; Kilby, 2008; Telford & Cosgrave, 2007; Comfort, 2007; Butts et al., 2012). Although there are significant conceptual overlaps between collaboration and coordination, collaboration appears to be a more encompassing concept of the two. For example, the aspect of harmonizing activities between organizations in order to complement their capabilities that might help them to “adapt” to the changes i.e. to fulfil the needs imposed by the unexpected changes in the external environment characterized by a crisis, is typical in interorganizational collaboration. Thus collaboration encompasses activities such as restructuring of organizations or units, establishing new units, assuming new membership and/or leadership to provide new services that help organizations “adapt”. But coordination or activities related to coordination does not necessarily encompass this aspect. The definition of interorganizational collaboration framed in context of the thesis highlighting this aspect is presented below.
Framing the concept of interorganizational collaboration in this thesis

As the objective of this thesis is to investigate interorganizational collaboration in the context of crisis response management and explore conditions that improve collaboration in crisis response, three aspects of collaboration are particularly relevant to shape the working definition of collaboration in this thesis. The first is the mutual adjustment of activities undertaken by different stakeholder organizations. This aspect of collaboration is captured in the definition given by Bailey and Koney (2000), “collaboration is an interorganizational relationship that involves significant investment, adjustments in the way partners operate in response to one another, and the risk of lost autonomy”.

The second is the effectiveness in decision making that can be achieved through interorganizational collaboration. Instead of having an organization to compromise with fulfillment of its individual goal, a multi-organizational decision making helps to solve a problem, taking into consideration fulfillment of individual goals of participating organizations as well as finding ways to achieve the joint goal of crisis response. To capture the thoughts of Gray (1985, 1989) and Gopalakrishnan & Okada (2007) reflecting the above aspect, collaboration includes multi-organizational decision making where participating organizations solve a problem jointly. Owing to the sudden changes in environment characterized by a crisis, a multi-organizational decision making enables joint problem solving between organizations with different capabilities. Since such problems are often “indivisible” in nature i.e. these problems are not solvable by a single organization, therefore a joint problem solving approach achieved through multi-organizational decision making in collaboration is likely to be more effective (Gray 1985; 1989; Gopalakrishnan & Okada, 2007). This means, interorganizational collaboration is crucial not only in managing interdependencies in service delivery and administrative functions but also in decision making (Bolland & Wilson, 1994).

The third aspect is related to adaptation of organizations to the external environment that can be achieved through collaboration. To portray this final aspect, an excerpt from Butts et al., (2012) is presented in context of crisis response efforts to Hurricane Katrina, a catastrophe that affected multiple sectors and stakeholders simultaneously.

“In the modern context, one facet of this reorganization is the mobilization (and, in some cases, formation ex nihilo) of organizations to respond to the adverse event. In the aftermath of the initial impact, large numbers of organizations may converge upon the affected area, joined eventually by new organizations that are synthesized to solve particular problems or exploit particular assets arising during the response process…

Although some such entities will act more or less autonomously, many will collaborate in order to pool resources, resolve task interdependencies, or leverage complementary capabilities…”
Even in the absence of a formal command structure, however, collaborative relationships between responding organizations can act as critical conduits for information, resources, and logistical support” (Butts et al., 2012, pp: 1, 2).

The above quote captures the complex needs that arise in a crisis which demand organizations to restructure, reorganize or undertake several activities different from traditional ones in order to adapt to these changes. Most importantly, collaboration and collaborative relationships seem to encompass such activities.

In the light of the above essential aspects of interorganizational collaboration it can be said that unexpected changes occur in a crisis when organizations are often required to provide new services and assume new structures, functions or leadership which are different from their traditional ones. Under such circumstances, collaboration across organizational borders contribute in aligning interdependencies, synthesize their critical functions, pooling resources, information and capabilities to cope with the radical changes in environment. (Drabek and McEntire, 2002; Wachtendorf, 2004; Butts et al., 2012; Scanlon et al., 2014). This brings us to the definition of interorganizational collaboration used in this thesis:

Collaboration is a multi staged process where organizations or units within organizations work together towards a shared goal for a finite period, may share assets during this time, and contribute to provide service with their old service unit or by establishing new service unit or by restructuring existing units (Frey et al. 2006; Leung, 2013). This service can range from resource pooling, mobilization, establishing effective communication, information sharing etc., in other words may include any kind of service to manage interdependencies between the units.

3.2 Adaptation of organizations during crises

Crises are “radical changes in environment” that cause large-scale social disruption and put normal organizational functioning to test which demand “adaptation” (Dynes, 1970; Dynes & Quarentelli, 1970; Dynes & Aguirre, 1979; Barton, 1969). To cope with these changes, a certain degree of structural and functional reorganization is required. Therefore, during crises, organizations often assume new roles, functions or leadership, different to those of “normal” times. Such structural and functional changes are otherwise not a common phenomenon (Dynes & Quarentelli, 1970; Majchrzak et al., 2007, 2015; Birkmann et al., 2008).

Emergent phenomenon

Crises change the demands posed on organizations. They often face unstable task definitions, flexible assignments, fleeting membership and pursuit of multiple goals...
which may be conflicting (Dynes & Quarantelli, 1970; Hart et al., 1993; 1997; Drabek & McEntire, 2003; Tierney, 2003; Majchrzak et al., 2007). Studies have suggested that traditional structures and organizational models have failed to adapt to the changes imposed by crises (Dynes, 1983; Birkmann et al., 2008; Tierney, 2003; Neal & Philips, 1995; Wachtendorf, 2004; Majchrzak et al., 2007, 2015). In order to adapt, organizations need to come up with new strategies or behaviour as their traditional roles, structures and task definitions do not provide scope for the necessary changes. These strategies and behaviour are unplanned and a result of the conditions that emerge unexpectedly. Therefore they are referred to as emergent strategy, emergent behaviour or emergent phenomenon (Dynes & Quarantelli, 1970; Mintzberg & Waters, 1985; Majchrzak et al., 2007, 2015).

The concepts of adaptation and emergent phenomenon are connected to collaboration. Taking the definition of collaboration used in the thesis, it is a process that includes organizations working together towards a joint goal in order to provide service by existing units, by restructuring existing units or by establishing new units. Furthermore, concepts of adaptation and emergent behaviour also refer to new strategies undertaken by organizations to cope with the demands of conditions that are changed by crises, which may include restructuring and reorganization. This means, by exploring the conditions for improved collaboration, i.e. by finding ways of intervention that can facilitate collaboration between organizations, it is likely that this intervention will contribute to strategies for better adaptation.

**Dynes typology of organized behaviour in crises**

Dynes (1970) developed a framework of the emergency or crisis response system. From localized emergencies to major catastrophes, the framework categorizes response of organizations to crises into four types. Dynes describes them as organized behaviour. The typology presents changes in organizational structures which depend on the change in tasks and functions of organizations. These changes are caused by the changes in the external environment that occur during crises. The typology acts as a descriptive tool to classify how organizations adapt to the changes during crises, what are the strategies that the organizations apply and how do they organize their response to types of crises.

*The framework by Dynes*

This section presents the framework developed by Dynes i.e. the four types of organized behaviour. The quotes below present the main idea behind the framework developed by Dynes.

“In every emergency there are organizations carrying out tasks which may be old, routine, assigned, everyday ones. Or, instead of regular tasks, there may be new, novel, assumed or unusual ones.” (Dynes, 1970: 136).
“The basic idea is that organizational mobilization and recruitment of personnel, and the operational problem of adapting to radically changed environmental conditions, can be examined best by separating out four different groups likely to respond to disasters, established, expanding, extending and emergent organizations. An attempt is made to show how interorganizational relationships are affected by boundary personnel, organizational sets, and organizationanizational legitimacy and how a community disaster structure emerges from the creation and coordination of task sub systems.” (Quarentelli & Dynes, 1977: 27; Britton, 1988: 372).

According to the framework organizational response to crises (referred to as organized behaviour) can be categorized into the following four groups.

Type I: This is the first type of organized response from existing organizations and is referred to as “established”. Here organizations perform pre-defined or regular tasks within their pre-defined or regular structures. Bureaucratic organizations fall under this category. There are no changes in their leadership or staffing during the response to crises. It can be argued that crisis response is one of the principal tasks and the legitimate responsibility of these organizations. Therefore, these types of organizations are most often the first line in of response, rescue and recovery. Type I organizations can also be regarded as the pillars in the formal emergency response system that exists in society. For example, all government authorities such as civil contingencies agency, fire and rescue services, police, defense forces, ambulance services etc. To sum up, Type I are “established” existing organizations with regular or pre-defined tasks and structures.

Type II: This is the second type of organized response from existing organizations, however these organizations remain “dormant” in normal times. Nevertheless, crisis response is the principal task of these types of organizations and a part of their legitimate responsibility. Therefore similar to Type I, these organizations are also a part of the formal emergency response system of the society. This group is referred to as “expanding” or Type II. The structure and membership of these organizations are different from Type I. While Type I organizations follow a pre-defined structure, functions and membership, the structure and membership of Type II organizations depend on the nature and impact of crisis. In other words, structure and membership of Type II organizations are not pre-defined in normal times. The term “expanding” denotes the expanding nature of structure and membership of organization in Type II, which as mentioned above, are variable. For example, Red Cross, salvation army, most non governmental organizations (NGOs) etc. To sum up, Type II are “expanding” existing organizations with pre-defined or regular tasks/functions but new structures.

Type III: The unique feature of this third type of organized response is, it may come from existing or non existing type of organizations. This means this group of organizations may or may not exist in normal times however may participate in crisis
response in both formal or informal manner. Crisis response cannot be regarded as the principal task of these type of organizations. This category is called Type III or “extending”. The term extending here denotes the extending nature of tasks that these organization may perform during their response. For example, a church group engaged in crisis response under the supervision of Red Cross or a private construction company providing their service and equipment in search and rescue operations in crisis. In both the examples it can be noted that neither the church group nor the private construction company have crisis response as their principal function or legitimate responsibility. Neither of them are a part of the formal emergency response system. Nevertheless, they can still conduct their new tasks using their old structures. To sum up, Type III are “extending” organizations with non regular tasks but pre-defined structures.

Type IV: This is the fourth type of organized response and groups or organizations in this category are referred to as “emergent” or Type IV. They are not part of the formal emergency response system and emerge due to the impact of crises. Due to their emerging nature, the groups or organizations under Type IV are regarded to perform non regular tasks and also assume new structures. For example, volunteers, voluntary groups etc. Figure 1 below, adapted from Dynes (1970), pp: 138, demonstrates the above mentioned typology of organized behaviour as a response from organizations during crises.

<table>
<thead>
<tr>
<th>TASKS</th>
<th>Regular</th>
<th>Nonregular</th>
</tr>
</thead>
<tbody>
<tr>
<td>STRUCTURE</td>
<td>Old</td>
<td>New</td>
</tr>
<tr>
<td>Type I</td>
<td>(Established)</td>
<td>Type III (Extending)</td>
</tr>
<tr>
<td>Type II</td>
<td>(Expanding)</td>
<td>Type IV (Emergent)</td>
</tr>
</tbody>
</table>

Figure 1: Types of organized behaviour and with respect to tasks and structures.

Evaluations of modern-day crises have demonstrated that a majority of these crises are catastrophes where a mix of all four types of organized behaviour presented above is required. The complexity and rapid onset of catastrophes implies that, it is more and more difficult to compartamentalize response of organizations into four categories because the organizational structures and functions change rapidly. For example, the works of Aiken and Hage (1968), Dynes, Quarantelli, and Wenger (1990) on the earthquake in Mexico in 1985, McEntire (2002) on the Fort Worth Tornado in
2000, Birkmann et al. (2010) on the Indian Ocean Tsunami in 2004, Leonard and Howitt (2010) on the Victorian bushfires in 2010, Helsloot and Ruitenberg (2004), Voorhees (2008), Batho et al., (1999) on the 9/11 attacks, and the case of biggest forest fire of Sweden in Västmanland in 2014 by Frykmer and Uhr (2015), Pramanik et al. (2015), Olycksutredning: Skogsbrand Västmanland, (2014) and Rapport från Skogsbrandsutredningen (2015) illustrate a mix of all types of organized behaviour arising due to complexity and rapid onset of catastrophes and as a result the simultaneous change in roles and structures of organizations. Another key feature highlighted in these studies is that, the lack of collaboration between organizations during their response. This suggests two important things. Firstly, organized response to complex crises are dynamic in nature which requires better abilities of organizations to adapt and secondly lack of collaboration further affecting the organized response.


Nevertheless from the perspective of this thesis, Dyne’s typology of four types of organized behaviour and the underlying research are relevant. This is because of the following:

Firstly, it presents a basic framework that depicts various organizations with different functions and structures in relation to the changes that occur in crises and the changes in response strategies that are required to fulfil the changed needs. Thus the typology represents the dynamic nature of functions to be performed by organizations.

Secondly, in complex modern crises, it is required that improved response strategies adopted by organizations meet the changing needs and thereby improve adaptation. This means if an organization is more flexible towards adopting response strategies, it is more likely that it will be able to adapt to the dynamic needs better. The examples of evaluations from recent crises clearly reveal so. Furthermore since collaboration implies a process where organizations work together towards a shared goal to provide a service this means, if crisis management professionals belonging to various
responding organizations are more willing to find themselves as a part of new organizations, assuming new tasks or leadership, are better prepared to work together with other organizations towards a joint goal for example they are more willing to utilize and contribute resources in a joint task which is a common situation in a crisis, this may lead to more effective collaboration while simultaneously improve abilities of organizations to adapt.

Finally, Dyne’s typology and emergent phenomena also reveal the role of organizational strain. They suggest that as the impact of a crisis increases, organizational functioning becomes more complex. While most organizations are comfortable with routine tasks, changes in the environment require ad hoc tasks and functions, such as those performed by extending and emergent organizations. This creates organizational strain (Britton, 1988; Drabek & McEntire, 2003; Dynes, 1970, 1994; Dynes & Quarantelli, 1976; Dynes & Aguirre, 1979; Dynes, Quarantelli, & Kreps, 1972). Hollnagel & Sundström (2006) in their research on response to Indian Ocean tsunami in Sumatra refer to traditional structures and procedures as “fossilized”, because these structures restricted the ability of organizations (the government authorities in the context of tsunami response) to adapt to the changed conditions, that created an organizational strain.

Some of the ways in which this strain is experienced are as follows. Existing organizations such as Type I (established) and Type II (expanding) are more comfortable in coordination by planning i.e. pre-defined coordination strategies that are planned and structured. However, when working together with unplanned groups such as Type III (extending) and Type IV (emergent), the circumstances require coordination by feedback which are more spontaneous coordination strategies that are unplanned, which is a challenge for Type I or Type II organizations (Dynes, 1970; 1994; Dynes & Quarantelli, 1976; Dynes & Aguirre, 1979; Dynes, Quarantelli, & Kreps, 1972; Bax et al., 1998). Another example of the strain includes potential conflicts that may arise from difference in values, orientation, goals and leadership when organizations assume new roles, structures or membership. These also cause lack of effective collaboration, which are illustrated by Britton (1988), Drabek & McEntire (2003), Dynes (1970), (1994), Dynes & Quarantelli (1976); Dynes & Aguirre (1979); Dynes, Quarantelli, & Kreps (1972) in their research on major crises across the world.

One of the important steps to mitigate organizational strain includes establishing effective methods of resource mobilization, allocation, communication and information management by facilitating collaboration between organizations (Hollnagel & Sundström, 2006). This further establishes the connection between adaptation, collaboration and Dyne’s typology which is, the typology presents the challenges or strain encountered by organizations that can be mitigated by facilitating
collaboration which also contribute to the abilities of organizations to adapt to the changes imposed by crises.

### 3.3 Social identity theory

The roots of social identity theory, SIT (Hogg & Abrams, 1988; Tajfel & Turner, 1979; Turner, 1982, 1985; Turner et al., 1987; Ashforth & Mael, 1989) can be traced back to the discipline of sociology (Hogg et al., 1995, Ashforth & Mael, 1989). Since its inception, it has found various applications in several fields of study, notably social psychology, organizational science and decision science (Ashforth & Mael, 1989; Hogg et al., 1995). One of the primary reasons for its success is that, it provides explanation for group processes and intergroup relations (Hogg et al., 1995). According to SIT, people tend to classify themselves and others into various social categories such as organizational membership, religious affiliation, gender, age, race, cohort etc. (Tajfel & Turner, 1985; Ashforth & Mael, 1989). This provides an individual with a set of beliefs, attitudes, feelings, behaviours and norms which are seen as appropriate for the group. This serves two purposes. It helps the individual to define herself in the social environment and to evaluate and predict the behaviour of others (Tajfel, 1972; Hogg & Terry, 2000, Ashforth & Mael, 1989).

According to Hogg and Terry (2000) and Turner (1975), social identity is based on intergroup social comparison that seeks to confirm or establish *ingroup favouritism* as a result of evaluation and distinctiveness between *ingroup* and *outgroup* (Tuner, 1975; Hogg & Terry, 2000). In turn, this helps to reduce uncertainty, which is a core human motivation (Asforth & Mael, 1989; Hogg and Terry, 2000) as humans tend to avoid uncertainty if they can (e.g. Curley, Yates and Abrams, 1986). Similarly, the familiar is preferred over the unfamiliar (Maslow, 1983; Luhmann, 2000), and people divide their social context into ingroups and outgroups, or “us” and “them”. As a result, the identification typically fosters *ingroup bias or ingroup favouritism* in collective settings, where people generally prefer to deal with ingroups before outgroups (Ashforth & Mael, 1989; Hogg & Terry, 2000; Brewer, 1999; Voci, 2006).

Another interesting characteristic of SIT is that, it aims to explain group behaviour and intergroup relations. Therefore it provides a way to study the latter in a broader context at different levels. These relations may exist between organizations, units or divisions with an organization or among other socio-demographic entities (Hogg & Terry, 2000). For example, an organization and its subunits may serve as social groups and objects for identification. Similarly, a social group can be a profession or a socio-demographic category distributed across organizations. Intergroup relations can
thus exist both within organizations or transcend boundaries (Hogg and Terry, 2000).

SIT is closely linked to the identity theory which finds its roots in psychology and explains role identification and role reciprocation (Stets & Burke, 2000; Hogg et al., 1995). While SIT and identity theory are closely connected, the major difference is that, SIT aims to explain group processes, group behaviour and intergroup relations, identity theory focuses more on individual outcomes. Its focus is more microscopic and aims to explain interpersonal interactions (Oakes et al., 1994; Hogg et al., 1995; Stets & Burke, 2000). Finally, SIT is also closely associated with self-categorization theory (Turner et al. 1987; Hogg & Turner, 1987; Oakes et al., 1994; Hogg & Reid, 2006), and group identification theories (Ashforth and Mael, 1989).

Relevance of SIT in this thesis

As this thesis focuses on interorganizational collaboration and how organizations adapt to crises, SIT is a useful and relevant way to study the relations and processes between emergent groups as a part of emergent behaviour. Highlighting the need to study social identification and organizational identity in context of crises or change, Ashforth and Mael (1996) posit that “an organization’s identity is most likely to be discussed when ambiguity, change or disagreement impair the utility of routinized processes. During normal times, most decisions and actions are part of stable, routinized process which does not require conscious choice of organizational identity”, (Ashforth & Mael, 1996: 29). Moreover, research suggests social identification accentuates ingroup behaviour which motivates positive attitude within ingroups, better leadership, cooperation, group cohesion, shared norms, empathy and emotional contagion. This builds trust and sense of familiarity within ingroups (Hogg & Terry, 2000; Jones & George, 1998; Macy & Skvoretz, 1998; Rockett & Okhyunsen, 2002). It therefore appears that the SIT approach to association and identification in social organizational context can be used as a lens to study the behaviour of these groups towards each other, how it can be moderated or influenced to improve interorganizational collaboration and collaborative attitudes.
Chapter 4 Methods and materials

As crisis management is an interdisciplinary field, research calls for use of several different methods and approaches. Moreover, increasing complexities of modern crises that impact many sectors, (e.g. functional, economic, geographical, political, industrial or social), calls for new trends in crisis management research, which is largely interdisciplinary in nature (Smith & Wenger, 2007; Hart et al., 2001, 2013). Several methods and approaches are used in this thesis. To understand the motivation behind the different methods and approaches used, it is important to discuss the journey of research, the overall process of how one study (appended papers) led to another. The first section summarizes the overall research process. A detailed presentation of each methodological approach and materials used are covered in forth coming sections under this chapter.

4.1 Research process

Section 2.2, already provided a short indication of the research process where the process of arriving at the research questions of the thesis was described. This section describes the stages in research and the motivation behind each stage. This is connected to the research questions as already listed in Chapter 2. It can be said that the research questions guided the research process and this section summarizes the same.

Stages

The three appended papers in this thesis can be divided into two distinct stage. The first one is explorative and the second is descriptive. The first research question which is addressed by Paper I falls under the explorative stage. The second and third research questions which are addressed by Paper II and Paper III respectively fall under the descriptive stage.
Purpose or motivation behind the stages

The overall purpose of the explorative stage was to be able to explore the directions for the project. This involved formulating a research question that was broad enough in scope to explore challenges in the field (i.e. interorganizational collaboration in crisis response management), and whose findings could provide concrete directions for further research. The second purpose of this stage was to be able to narrow down the study from a very broad level, to a more specific level. This was necessary since it was impossible to explore every possible challenge that exists in interorganizational collaboration in context of crisis response management. In order to fit the two purposes, a systematic review of international scientific literature was chosen. The review narrowed the focus of the study by exploring challenges in interorganizational collaboration in context of crisis response management that were documented in international scientific literature. Further details of the review are presented in coming sections of this chapter. Several types of challenges were explored which were classified under broad themes.

As a second method that fulfilled the two purposes of the explorative stage, and to complement the systematic literature review, semi-structured interviews were conducted with a further limited focus on civil and military organizations to explore challenges in interorganizational collaboration in crisis response. Thus professionals from several other organizations which are commonly involved in crisis response were not included in these interviews, for example police, fire and rescue services etc. Section 2.2 already presented the motivation behind the special focus in the civil-military collaboration context. Details about the sample and interviewees are presented in coming sections. The two methods, namely the systematic review of international literature and the semi-structured interviews complemented each other in the following manner. While the literature review aimed at exploring challenges from a broad perspective, the semi-structured interviews focused on challenges in civil-military collaboration contexts. The literature review had the advantage that it revealed challenges related to many different contexts and the interviews complemented those findings by providing opportunities for more detailed investigations.

In case of the descriptive stage, the purpose was to be able to demonstrate whether changes in familiarity and expectation of future cooperation influenced the extent to which resources are utilized from other organizations in a joint task during crisis response and the extent to which resources are contributed to a joint task. The underlying motivation behind this purpose was to be able to provide suggestions to improve conditions that can facilitate collaboration between organizations. Section 2.2 already presented the process of arriving at the investigation of two independent variables called familiarity and expectation of future cooperation (ECFI) from the findings from Paper I. The section also presented the motivation behind choosing experiments as a research method in Papers II and III.
From the perspective of the descriptive stage, experiments in controlled settings demonstrated quantitatively whether change in familiarity and ECFI had an influence on extent of resource utilization or extent of resource contribution. Such experiments are easier to base normative claims on (i.e. suggestions on how to conduct things in practice) than the more qualitative descriptions mostly found in the literature. Details about the experiments are presented in coming sections of this chapter. In addition to the experiments in controlled settings, the participants also took part in short interviews and surveys. The figure below presents the conceptual representation of each paper with corresponding stage, purpose and approach taken.

<table>
<thead>
<tr>
<th>PAPERS</th>
<th>RESEARCH STAGE, PURPOSE AND METHOD</th>
</tr>
</thead>
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| PAPER I | Research stage: Exploratory  
Research method: Systematic review of international scientific literature and semi-structured interviews.  
Purpose:  
1. To be able to arrive at a more narrow problem with specific focus from a broader problem.  
2. To provide directions to the project. |
| PAPER II | Research stage: Descriptive  
Research method: Descriptive experiment and qualitative surveys.  
Purpose:  
1. To establish whether change in familiarity and ECFI have any significant effect on extent of resource utilized.  
2. To make an underlying normative claim that in order to have a desired effect on extent of resource utilized in joint task, it is possible to change levels of familiarity and ECFI. |
| PAPER III | Research stage: Descriptive  
Research method: Descriptive experiment and qualitative surveys.  
Purpose:  
1. To establish whether change in familiarity and ECFI have any significant effect on extent of contribution of resources (EOC).  
2. To make an underlying normative claim that in order to have a desired effect on extent of resource contributed (EOC) in joint task, it is possible to change levels of familiarity and ECFI. |

Figure 2: Conceptual representation of the research process

4.2 Literature review

Review of scientific literature is an essential part of research. It leads to familiarization of the field of study and exploring several paradigms. Various methods were employed to review literature. One of them was a systematic review of international scientific literature that was performed in Paper I on how the field of international scientific literature documented the area of challenges in interorganizational collaboration in crisis response management. Thus this review aimed to look at what these challenges were, how were they perceived or expressed and finally whether reasons behind such challenges were documented in international scientific literature. The systematic review also helped to reveal that these challenges in interorganizational collaboration
are not unique to crisis response management contexts, or to civil-military collaboration in crisis response contexts but can be extended to other management contexts connected to collaboration between civil organizations.

Similar, though not identical approaches in performing systematic literature reviews are used in scoping studies to gain an overview of what exists in terms of scientific literature in one research discipline or more (See Arksey & O’Malley, 2005). However, it is to be noted that, while in scoping studies the coverage of scientific literature may be quite broad, a systematic literature review on the other hand, most commonly addresses more specific questions and therefore offers the scope to narrow down at a more specific level (Moher et al., 2009).

This systematic review which was conducted in Paper I was inspired by PRISMA\(^1\). Several filtering processes or steps to identify final list of relevant literature were used. Finally, the findings from the systematic review were compared with those from the semi-structured interviews. Three steps of filtering international scientific literature were used. The first one is called identification where combinations of keywords were used to identify international scientific literature. These combinations of keywords were used to generate number of hits. A list of combination of keywords called search queries with corresponding number of relevant results can be found in the appendix of Paper I. A total of 36 search queries were used which returned results and the total number of returned results were 2522 articles. The second step of filtering is called screening. In this step articles identified previously were screened based on their title and abstract. Details on the second step of screening are presented in Paper I. The third step called eligibility and screening further streamlined this search. In this step, all 171 articles from the second step were read to determine further relevance, duplicates were removed, to arrive at the final list of 74 relevant articles. This literature search was conducted on scientific databases. These databases included the

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\(^1\) PRISMA: Abbreviation for Preferred Reporting items for Systematic Reviews and Meta Analyses. It is a systematic way of reporting scientific literature. It was first developed and used in the field of Medicine in 2009. For more details see, Moher et al., 2009.
database provided by Lund University called Lubsearch\textsuperscript{2}, ISI Web of Science\textsuperscript{3}, Scopus\textsuperscript{4} and Google Scholar\textsuperscript{5}.

Cross referencing and unstructured search formed another method of reviewing literature. In this method, references found in the articles that were short listed through the more structured search were looked into to identify more related articles. Thus this method helped to find and review additional literature that was relevant to the problem under study. Finally, grey literature consisting of international policy documents, minutes of meeting, summary and excerpts were also reviewed. Both structured and unstructured searches were conducted for Papers II and III. Much of the literature identified through the structured and unstructured reviews of literature conducted during Paper I was also useful for Papers II and III.

4.3 Semi-structured interviews

According to Kvale (2007) interviews are highly valuable to gain understanding of meanings that people associate with contexts. The semi-structured interviews in Paper I were conducted to complement the systematic review of international literature. Since the aim of Paper I was to explore various challenges to interorganizational collaboration and the empirical study conducted was limited to civil-military collaboration context, the choice of semi-structured interviews as a research method in Paper I was a good one. This is because this method offers the scope of follow up questions which allow improvisation, thus enables additional probing during the data collection process.

All interviews were conducted based on an interview guide. The interview guide was typically divided into two parts where the first part was more general and open while the second part was more specific and contained follow up questions with scope for

\textsuperscript{2} Lubsearch: Lubsearch is a shared entry point or platform to all scientific databases provided by Lund University. It provides access to all shared resources, journals, thesis and books. Source: https://www.lub.lu.se/.

\textsuperscript{3} ISI Web of Science: It a scientific database provided by Thomson Reuters. Formerly known as Web of Knowledge, it covers over 90 million records of publications in almost 55 disciplines. Source: http://wokinfo.com/citationconnection/

\textsuperscript{4} Scopus: One of the largest abstract and citation database of peer-reviewed literature covering the fields of science, medicine, technology, social sciences, and arts and humanities, with 53 million records, 21,915 titles and 5000 publishers. Source: http://www.elsevier.com.ludwig.lub.lu.se/online-tools/scopus.

\textsuperscript{5} Google Scholar: A database provided by internet search and browse giant Google, indexing approximately all forms of literature available on internet, i.e. scientific, grey or unscientific.
additional probing. Such a design was followed to address researcher and respondent bias, which are discussed in details in chapter 6. All interviewees were contacted in advance and the participation was voluntary. The invitation to the interviews was common for all interviewees and contained a brief background of the researcher. Some of the standard protocols maintained in the invitation were for example, the invitation explicitly stated that the interviews shall be used only for the purpose of research, the confidentiality of the interviewees shall be maintained and that there was no potential clash of interest in the research process.

There were 12 interviews in total. All the interviewees were trained for domestic and international crisis response operations with interactions between civil and military organizations. All interviewees represented Sweden in international contexts in international humanitarian operations. 6 interviewees were experienced crisis management professionals working for MSB, the Swedish Civil Contingencies Agency and were posted as Project officers, Liaison Officers, Programme Officer or Coordinator in international humanitarian operations with extensive exposure to civil and military interaction. MSB is the largest government responding body to crises in Sweden, civilian in nature, which plays an active role in major international operations under EU, NATO and the UN. The rest half were interviewees from Karlberg Military Academy in Sweden who had experience of being part of international military operations under NATO, EU or UN and were part of humanitarian response with exposure to civil military interaction. Details on how the threats to generalizability and representativeness of the sample have been addressed are presented in details in chapter 6.

4.4 Experiments

Two experiments were conducted in this research one for Paper II and one for Paper III. Independent variables employed for both the experiments were familiarity and ECFI. The dependent variable for Paper II was extent of resource utilized from other organizations and for Paper III was extent of contribution of resources to other organizations in a joint task. In Paper II the operationalization of the dependent variable i.e. extent of resource utilized was carried out in terms of organizational ingroup bias. In the context of the experiment in Paper II, organizational ingroup bias means systematic favouring of resources and equipment from one’s own organization over others. This means the experiment tested whether by changing familiarity and ECFI among organizations limited the effect of organizational ingroup bias, consequently resulted in better utilization of resources and equipment from other organizations. Similarly, in Paper III, the experiment tested whether by changing familiarity and ECFI, there was an effect on extent of contribution of resources
(EOC) to other organizations from one’s own. This means the dependent variable for Paper III was EOC. Both the experiments were based on decision making choices. The motivation behind choosing experiment as a research method in Papers II and III has already been presented in section 2.2 of chapter 2 and section 4.1 of this chapter. There were 111 participants from four different organizations, namely the Swedish police, the Swedish fire and rescue, MSB and the Swedish Armed Forces who took the experiment. All 111 participants took both the experiments. All participants were trained for joint crisis response operations in domestic and international contexts. The participants chosen had a varied level of experience and exposure in decision making roles in crisis management. They also belonged to different hierarchical levels. High ranking officers were approached from each organization who helped in identifying volunteers for the experiment with different levels of experience and belonging to different levels in hierarchy. The participants were mostly Swedish nationals representing Sweden in domestic or international crisis response operations. The experiments were conducted both online and offline. Identical instructions were given for both online and offline experiments. There were four experimental conditions or scenarios that were constructed in the experiments with respect to the two independent variables and the dependent variables. A within subject design was followed for both the experiments. This means all 111 participants were exposed to all four scenarios or experimental conditions in a randomized order. Further details on design of experiments and instructions can be found in Paper II and III.

4.4.1 Decision rationales as qualitative answers

Decision rationales in the form of free text qualitative answers (open-ended surveys) were recorded for both the experiments. Short interviews were conducted with the participants on completion of both experiments to gain further indications on perception of familiarity and ECFI as constructs, their significance in real crisis response operation and collaboration contexts and finally their perception and significance in the experiments. Binary coding was performed on the qualitative answers to record the construct of familiarity and ECFI in both the experiments in Paper II and III. These were used to address threats to internal validity and external validity, and are further discussed in details in chapter 6.
4.5 Surveys

According to Sapsford (2007: 5), “a survey describes a population under study”. He further posits that survey helps to “standardize” the research. An essential characteristic of surveys is that the same questions are asked in the same way to the population under study to gain answers. These answers are usually quantifiable in nature (Sapsford, 2007). Surveys have been used as a research method to complement the experiments in Papers II and III. The motivation behind conducting the surveys has been to be able to understand the experimental responses of the participants better. The participants were asked to provide their answers using a Likert scale. The scale was used to measure attitudes in the sample (Jamieson, 2004). A 7 point Likert scale (close-ended survey) was employed in the survey which used the scale of 1 to 7 that determined strength of agreement in ascending order, with 1 implying strongly disagree and 7 implying strongly agree. Questions were posed in context of overall crisis management practices related to familiarity and long term commitment or ECFI. These were used to address threats to validity, discussed in details in chapter 6.

<table>
<thead>
<tr>
<th>Paper</th>
<th>Methods and Materials</th>
<th>Number of respondents</th>
<th>Composition</th>
<th>Mean age and mean experience respectively in years</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Semi-structured interviews</td>
<td>12 interviewees</td>
<td>6 MSB</td>
<td>38 7</td>
</tr>
<tr>
<td></td>
<td>Systematic review of international scientific literature</td>
<td></td>
<td>6 Karlberg Military Academy</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Experiment</td>
<td>111 participants</td>
<td>19 Police</td>
<td>39 11</td>
</tr>
<tr>
<td></td>
<td>Open-ended qualitative surveys</td>
<td></td>
<td>21 Military</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>34 Fire and rescue</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>37 MSB</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Experiment</td>
<td>111 participants</td>
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<tr>
<td></td>
<td>Open-ended qualitative surveys</td>
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<td>21 Military</td>
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</tr>
<tr>
<td></td>
<td>Close-ended surveys</td>
<td></td>
<td>34 Fire and rescue</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>37 MSB</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Table of summary- methods, materials and sample.
Chapter 5 Research contributions

This chapter summarizes the findings of the papers appended to this thesis and presents the contributions of each towards the research questions formulated for this thesis.

5.1 Addressing Research Question 1

The first research question formulated for the thesis was:

What are the challenges to interorganizational collaboration in crisis response management?

Findings from Paper I addressed this research question. This paper identified various types of challenges arising in interorganizational collaboration in context of crisis response management. A systematic review of international scientific literature was conducted which was complemented by semi-structured interviews, in which the latter had a specific focus on civil-military collaboration context. Although the title and the research question in Paper I mentions coordination, the review of international scientific literature was conducted using both the terms collaboration and coordination. It has been already presented in chapter 3 that the terms collaboration and coordination have been used interchangeably in research and practice. In addition, the semi-structured interviews with a specialized focus on civil-military collaboration also revealed that collaboration and coordination are used interchangeably in practice, in crisis response management context. Thus it was reasonable to include both collaboration and coordination as keywords in the literature search to increase the possibility of being able to identify majority of available scientific literature that are relevant. The findings from the literature review and those from the semi-structured interviews were compared. The findings of the paper can be summarized as follows.

Firstly the findings in Paper I indicate that similar challenges were identified in the systematic review of international scientific literature, in which both collaboration and coordination were used as keywords to perform the search and those that were revealed through semi-structured interviews performed with a limited focus on civil
military collaboration context in crisis response management. This suggests that the challenges in interorganizational collaboration are not limited to any specific type of collaboration, such as civil-military, but are valid for collaboration contexts in general.

Secondly it was observed from both scientific literature and interviews that the challenges were arising from differences between organizations. Various types of challenges that were explored were categorized under five different themes, namely communication, information management, organizational structure, organizational culture and organizational identity. These themes indicated types of differences existing between organizations, which further revealed how various types of differences between organizations led to specific types of challenges. For example if we consider difference between organizations in terms of using terminologies, this difference resulted in challenges to communicate or manage information. To consider another example, difference between organizations in how the same information is treated, how the information is collected and how the data is collated or stored, can lead to challenges between organizations to communicate.

Moreover, the five themes were interconnected. The interconnectedness of the themes indicated that a specific type of challenge could arise from one or more differences that exist between organizations. It also meant, a specific difference could give rise to one or more type of challenges. For example, challenge in communication could arise from different use of terminology while challenge in information management could arise from different methods of data collection, different methods of storing data as well as different treatment of same information. Again, difference in organizational structures could also lead to challenges in communication and sharing information. This is because, it is a problem to identify the “correct person” in the same hierarchical level in different organizations that are structured differently, who shall delegate the process of disseminating information in her own organization or who should be contacted to gather the relevant information from an organization.

The third finding for the paper is also connected to the interconnectedness of the five themes explored, in which the theme named organizational identity is at the cross section of all other four themes. Both the review and the empirical study indicated that challenges arising from the difference based on organizational identity between organizations have an influence on other differences that exist between organizations. This is because the difference based on organizational identity shapes the perception of professionals from various organizations on how they perceive these differences. Difference in terms of organizational identity implies the differences in terms of values, attitudes and backgrounds of professionals and organizations. So for example, challenge in communication may not only arise due to difference in terminology or difference in organizational structure but also due to difference in organizational identity. Lack of understanding of goals and priorities (organizational culture), hierarchy and leadership (organizational structure), methods of data collection
information management and organizational culture) are influenced by the lack of understanding in values, attitudes and backgrounds (organizational identity). Thus it may be noted a challenge arising in communication can be a result of interaction between many other differences or themes nevertheless organizational identity bears an influence on all and therefore remains at the cross section.

The fourth and final finding is where facilitators and inhibitors to collaboration have been identified in literature review and also supported by the interviews. Socialization was one such facilitator that came up repeatedly in the review as well as interviews where establishing better communication, informal contacts, “getting to know” were reported to create more open attitudes, understanding and also trust between organizations. Interviews suggested that challenges in communication in several occasions could be reduced considerably by promoting informal meetings where goals, tasks and priorities of civil-military organizations were shared more openly which created better understanding and led to open attitudes among professionals. Further, the interviews revealed that in long term missions where civil-military collaboration were expected to run longer, such informal meetings were more effective as the professionals were interested to know their partner actors with whom they may have to work for a longer period. This in a way motivated to address the challenges to collaboration that may arise especially due to difference in values, attitudes and lack of understanding of each other. These gave indications towards motivation of “familiarizing” organizations of one another and expecting to cooperate in future that in several occasions turned successful to overcome challenges to collaboration.

Table 2 below, adapted from Table 1 in Paper I (Pramanik, 2015) presents the various types of challenges explored in interorganizational collaboration. The challenges are presented as “examples” in column 3. The various themes under which specific types of challenges were categorized are presented in column 1, named “themes”. Several factors have been listed, explored in the systematic review of scientific literature, which appeared to have an impact on interorganizational collaboration and coordination. They are presented in column 2, named facilitators/inhibitors.
Table 2: Summary of findings in Paper I (adapted from Pramanik, 2015).

<table>
<thead>
<tr>
<th>Themes</th>
<th>Inhibitors/facilitators to coordination</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Socialization</td>
<td>Use of different terminologies</td>
</tr>
<tr>
<td>Information management</td>
<td>Socialization; informal contacts for exchange of information</td>
<td>Use of non-uniform information platform/infrastructure; use of non-uniform method of collating data</td>
</tr>
<tr>
<td>Organizational structure</td>
<td>Flexibility; formalization</td>
<td>No clarity on whom to contact for a particular information in a hierarchy; whom to send to which meeting</td>
</tr>
<tr>
<td>Organizational culture</td>
<td>Flexibility in approaches and/or decisions; formalization; standardization</td>
<td>Different treatment to same information; different treatment to same meeting; different treatment to other’s goals</td>
</tr>
<tr>
<td>Organizational identity</td>
<td>Attitudes (personal and/or organizational); background (historical/political)</td>
<td>Perception of another organization; ideologies leading to cooperative attitudes</td>
</tr>
</tbody>
</table>

5.2 Addressing Research Question 2

The second research question formulated for this thesis was:
Do change in familiarity and expectation of future cooperation influence the extent to which crisis management professionals utilize resources from other organizations in a joint task?

Findings from Paper II addressed this research question. Paper II was based on an experiment to test whether the change in two independent variables identified
namely, familiarity and expectation of future cooperation (ECFI) influence the extent to which crisis management professionals in decision making roles utilize resources from other organizations. The dependent variable which is extent of resource utilized from other organizations was operationalized in terms of organizational ingroup bias. The tendency to systematically favour the utilization of resources from one’s own organization over others can be understood as organizational ingroup bias. Operationalization of the independent variable called familiarity concerns whether the crisis management professionals in decision making roles are familiar with the resources, equipment and capabilities of other organizations, and operationalization of ECFI concerns whether the crisis management professionals in decision making roles expect to cooperate with other organizations in future crisis response operations. The task in the experiment was about making choices on utilizing resource and equipment from organizations which could be one’s own or other, in context of a joint task of responding to a crisis, given there is a change in familiarity and ECFI. Four experimental conditions were constructed over which change in independent variables, i.e. familiarity and ECFI were controlled. There were a total of 111 participants who were crisis management professionals in decision making roles from four different organizations namely, the Swedish police forces, fire and rescue services, the Swedish Armed Forces and the MSB. These organizations are also among the most commonly identified crisis responders in Sweden. All 111 participants were exposed to all four experimental conditions in a randomized order. Findings from the experiment suggest that higher familiarity and ECFI moderate the effects of organizational ingroup bias. This means, with change in familiarity and ECFI, the extent of utilizing resources from other organization is influenced. Thus the findings from this paper indicate that in a situation where organizations are likely to be involved in joint crisis response operations, increasing the degree of familiarity and long term commitments increase the extent to which crisis management professionals in decision making roles shall utilize resources from other organizations.

5.3 Addressing Research Question 3

The third research question formulated for this thesis was:

Do change in familiarity and expectation of future cooperation influence the extent to which crisis management professionals contribute resources to other organizations in a joint task?

Findings from Paper III addressed this research question. Paper III was based on an experiment to test whether the change in two independent variables identified namely, familiarity and ECFI influence the extent to which crisis management professionals in decision making roles contribute resources to other organizations.
This means, the effect of familiarity and ECFI was tested against the dependent variable called EOC (extent of contribution). Interorganizational collaboration involves both the aspects of utilizing resources from other organizations and contributing resources from one’s own organization to the joint cause of responding to crises. Thus Paper III becomes a natural follow up to Paper II, where the effects of familiarity and ECFI are tested to investigate the extent to which crisis management professionals in decision making roles contribute in terms of resources from their own organization to a joint task of responding to crises.

The experiment is conducted with the same sample of 111 participants who participated in the experiment in Paper II. The operationalization of the independent variables familiarity and ECFI was similar to that in Paper II, meaning familiarity implied whether the crisis management professionals in decision making roles are familiar with the resources, equipment and capabilities of other organizations, and ECFI implied whether the crisis management professionals in decision making roles expect to cooperate with other organizations in future crisis response operations.

The task in the experiment concerned making choices on extent of contribution, i.e. number of units comprising of resource and equipment that must be contributed to a joint task of responding to a crisis, keeping in mind the possibility of a crisis that may arise simultaneously at home which was not a joint task and would not involve other responding organizations. This nature of task in the experiment was chosen to direct the crisis management professionals in decision making roles towards a relative balance between joint goal and individual goal. Further, in terms of design of the experiment this relative balance between two goals meant minimizing the possibility of participants to choose either extremes of the dependent variable namely EOC (extent of contribution), i.e. to contribute either all available resource and equipment in the joint task, or none, which helped to mirror the reality.

Findings from the experiment indicate two things. Firstly, higher familiarity causes lower EOC, i.e. crisis management professionals lower their extent of contribution of resources to the joint task when familiarity with other organizations increases. Secondly, ECFI does not have a significant effect on EOC. However, surveys conducted to complement this experiment reveal that both familiarity and ECFI are perceived to be significant motivating factors to be able to contribute in a joint task in context of crisis response. Short interviews and decision rationales provided by the participants in the experiments provide some indications on why the findings of the experiment and those from the surveys appear different. Participants relate higher familiarity with higher trust which would mean higher possibility of other organizations “to be able to do their part” in a joint task, therefore lower EOC. Consequently this also means higher possibility to be able to achieve joint goal when other organizations “are able to do their part”. Alternatively this also means, the possibility that the other organizations are able to contribute “with their part” is
higher enabling lower EOC which also creates higher possibility to fulfil individual goal. Chapter 6 discusses the implications of the above findings on EOC in more details, reasons behind no significant effect of ECFI on EOC in the experiment and addresses what higher familiarity and ECFI with respect to EOC can imply in context of crisis planning, preparedness and collaboration.

Table 3: Summary of research contributions

<table>
<thead>
<tr>
<th>Research questions</th>
<th>Research contributions</th>
<th>Research method</th>
<th>Appended paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are the challenges to interorganizational collaboration in crisis response management?</td>
<td>Several challenges were identified that could be categorized under five different themes namely, communication, information management, organizational structure, organizational culture and organizational identity. The themes were interconnected and organizational identity was at the cross section of all themes. Similar challenges were explored through review of literature and semi-structured interviews focused on civil-military collaboration contexts.</td>
<td>Review of international scientific literature Semi-structured interviews of crisis management professionals focused on civil-military collaboration contexts. Comparisons between the literature review and the interviews.</td>
<td>Paper I</td>
</tr>
<tr>
<td>Do change in familiarity and expectation of future cooperation (ECFI) influence the extent to which crisis management professionals utilize resources from other organizations in a joint task?</td>
<td>Change in familiarity and ECFI influence the extent to which resources are utilized from other organizations in a joint task. Higher degree of familiarity and ECFI lead to higher extent of utilization of resources from other organizations.</td>
<td>Experiment. Open ended qualitative answers.</td>
<td>Paper II</td>
</tr>
<tr>
<td>Do change in familiarity and expectation of future cooperation (ECFI) influence the extent of contribution (EOC) in a joint task?</td>
<td>Change in familiarity influences the extent to which resources are contributed to other organizations in a joint task. Change in ECFI does not have any significant influence on extent of contribution. Higher degree of familiarity leads to lower extent of contribution (EOC).</td>
<td>Experiment. Qualitative surveys. Open ended qualitative answers.</td>
<td>Paper III</td>
</tr>
</tbody>
</table>
Chapter 6 Discussion

This chapter presents discussions. The discussions are based mainly on two main grounds, one where the research contributions from the papers and their implications are discussed in relation to the objective of the thesis and the second is related to the overall quality of research based on the methods, materials and approaches taken and how did those contribute to addressing the threats to validity and generalizability of the research. Finally, limitations of the research are presented. Future research directions are also discussed in the chapter.

6.1 Reflecting on research contributions

6.1.1. Minimizing challenges to interorganizational collaboration in crisis response management

The contributions in Paper I presented various challenges that could be categorized under five different themes and these themes implied the differences that exist between organizations due to which the challenges arise. The contributions also demonstrate interconnectedness between the five different themes namely communication, information management, organizational structure, organizational culture and organizational identity of which organizational identity was one such theme which was a cross section among all other four. These contributions are essential as these provide indications on ways to minimize these challenges, some of which could also be explored in the review of international scientific literature and the interviews.

Findings from the review of international scientific literature and interviews suggest that differences in organizational structures, hierarchical and leadership patterns, formal and informal practices, procedures, socialization processes, communication and information management practices, task and role functions are attributes of differences in organizational culture (Hatch & Schultz, 1997; Nathan, 2015). Based on these, members or professionals of the organization internalize or develop certain values and attitudes which influence their behaviour, interaction and decision
making. By doing so, members of the organization “make sense” of what their organization is about and what is expected as appropriate behaviour by virtue of belonging to that organization (Hatch & Schultz, 1997). Thus the members of the organization have some shared assumptions and beliefs that help the members to define themselves in the social and cultural context of the organization they belong to. In other words, the members “identify” themselves with respect to this socio cultural environment of organizations that they belong to, which becomes their organizational identity (Hogg et al., 1995; Ravasi & Scultz, 2006).

This further means that the challenges experienced by professionals belonging to an organization towards other organizations, are most likely to be influenced by shared beliefs and assumptions of roles, norms, values, practices and procedures of an organization to which the professionals belong. In other words, challenges exist and so do the differences between organizations, however these are also influenced by comparison and contrast with respect to one’s own organization.

Indications on ways to minimize these challenges were found in the interviews. Informal meetings with better scope to share goals, tasks and priorities of partner organizations in an open manner in several occasions could minimize over all challenges to collaboration. Considering the politicized nature of modern crisis response management, where political backgrounds and mandates also influence attitudes, values and beliefs of organizations that lead to challenges in interorganizational collaboration, there is a need for opportunities of dialogue between collaborating organizations to share their political backgrounds and mandates more openly. These have the potential to minimize challenges to interorganizational collaboration.

Further it was revealed through the interviews in civil-military collaboration contexts that when partner organizations had to collaborate in long term missions, the motivation towards such collaborative meetings was higher. This means the expectation to collaborate in future with partner organizations could also act as facilitator to effective collaborative efforts between organizations that helped to minimize the overall challenges to collaboration.

6.1.2 Extent of Utilization of Resources and Extent of Contribution: Practicing interorganizational collaboration in context of crisis response management

Contributions from Paper I provided indications that better socialization and long term commitment could act as facilitators in interorganizational collaboration. Framing these as independent variables namely familiarity and ECFI, Paper II and Paper III tested the influence of change in familiarity and ECFI on two key aspects of
collaboration, one is extent of utilization of resources from other organizations and the other is extent of contribution of resources to other organizations. Effective resource mobilization, resource sharing and allocation being the major function in collaboration, the effect of change in familiarity and ECFI on extent of utilization of resources and extent of contribution further establishes the significance of increasing familiarity and ECFI in practice to improve collaboration in context of crisis response management.

Paper II demonstrates that by increasing familiarity and ECFI, the effects of organizational ingroup bias can be moderated. In other words higher familiarity and ECFI can increase the extent of utilization of resources from other organizations. Such increased utilization of resources from other organizations might not automatically lead to an overall improved management and response to crises. However, it seems reasonable that the greater extent of utilization of resources from other organizations will contribute to an increased ability of the organizations involved to adapt to changing conditions that arise in crises. Therefore, it can be claimed that greater degree of familiarity and ECFI will improve ability of organizations to collaborate, in situations of crises that are characterized by changing conditions and the need for flexibility.

Paper III demonstrates that higher familiarity led to lower extent of contribution of resources from one’s own organization, while higher ECFI although acted as a motivation to collaborate however, did not affect the extent of contribution. This might appear a contradictory result when comparing it to the results of Paper II, where increasing familiarity and ECFI led to an increased utilization of resources from other organizations. However, the qualitative answers from the surveys, short interviews and discussions during debriefing in Paper III provide some explanations for this. Several participants indicated that they associate familiarity with trust. Higher familiarity resulted in higher trust. Higher trust also implied to trust the resources, capability and equipment of the other organization in order to successfully manage the joint task of crisis response. This is also supported by the literature on familiarity, which indicates a strong positive correlation between the two concepts, namely familiarity and trust (Gulati, 1995; Jonker & Treur, 1999). Therefore, one reasonable explanation for the observed effect, i.e. extent of contribution (EOC) decreases when familiarity increases is that, increased familiarity lead to increased trust in the other organization to “to do their part” in the joint task, and therefore the participants did not see the need to contribute with more resources or equipment of their own. Thus, the participants perceived that the joint task can be accomplished with a lower extent of contribution (EOC) from their side, which then enabled them to withhold more resources and equipment to deal with other emergencies that they might have to deal with simultaneously in addition to the joint task.
The qualitative results also revealed another interesting observation. Although, the extent of contribution (EOC) decreased when familiarity was increased, the participants indicated that they were more motivated to contribute to joint task when they were familiar with the other organization. Again, this might appear contradictory with respect to the results from the experiment. However, it might make perfect sense for the participants.

This is because increased familiarity might lead to more effective allocation of resources, i.e. one does not contribute higher number of resources and equipment to a joint task “just to be sure”, and therefore more resources are available to deal with other contingencies that may arise simultaneously. This also means, with greater degree of familiarity, participants are able to balance the joint and individual goals of organizations better than in absence of familiarity. Thus, there might not be a contradiction at all. Instead, the combined results indicate that in a situation where there is a joint task of crisis response which is to be solved by two or more organizations, a high degree of familiarity with each other’s resources, equipment etc. is most likely positive.

Although this might seem reasonable based on the results from the experiments, it is difficult to say whether greater degree of familiarity would actually lead to better ways of responding to crises. More research would be needed to investigate if that is the case. Nevertheless, based on the results in the thesis, it seems warranted to recommend professionals involved in crisis management to increase their familiarity with capabilities, resources, equipment etc. of other responding organizations. Such measures might not cost much money and they might have other positive effects than the ones studied here. For example, it might not only lead to increased informal networks which might be useful during a crisis but also before a crisis occurs. Another advantage of increasing degree of familiarity and long term commitment can be lowering overall cost of collaboration for organizations. Better knowledge on resources, equipment and competences of partner organizations, better understanding of goals, values, beliefs, attitudes and work procedures or work routines of partner organizations, in other words familiarizing with partner organizations may help to plan cost of collaboration better and also reduce these costs by getting involved in long term commitments with partners. Since research also suggests that higher cost of collaboration lowers motivation to collaborate (Dyer, 1997; Mishra, 1996; Evans & Wolf, 2005), it is reasonable to find ways to increase familiarity between organizations that help to build trust, engage in long term commitments that can facilitate better planning and reduction of costs of collaboration etc.

Changing of ECFI (defined as anticipation of working towards a common goal in future by Ben-Yoav in 1984 a,b) in the experiment presented in Paper III had no significant influence on extent of contribution (EOC). Thus, based only on the result
of the experiment in Paper III, it is not possible to claim that efforts to establish long term commitment between organizations in crisis response management contexts will lead to changes in behaviour of crisis management professionals. However, there might still be reasons to consider efforts to increase ECFI among different organizations that might be involved in joint tasks of crisis response and management. The reason is, if we combine all the results from both the experiments, the open-ended qualitative answers and the close-ended surveys conducted, together the results suggest that higher degree of ECFI leads to higher willingness to utilize resources and equipment from other organizations in a joint task, similarly higher ECFI also leads to higher willingness to contribute in a joint task, thus higher ECFI acts as a higher motivation for collaboration in general. Therefore, measures to increase ECFI might still be justified. For example, one might establish long term cooperation agreement between organizations or in other ways indicate that two (or more) organizations are seen as partner actors in the management of future crises and that efforts will be made to collaborate effectively. Moreover, some of the measures aimed at strengthening familiarity among organizations are also likely to foster long term commitment to collaboration. For example, continuous efforts to familiarize crisis management professionals from one organization with the capabilities, resources, equipment etc. of another organization will most likely lead to a sense of long term commitment to collaboration.

6.1.3 Conditions to improve collaborative behaviour in crisis response management: Contributions of the thesis

The contributions of the thesis lie in the fact that the research conducted in the thesis is able to demonstrate that by changing the degree of familiarity and long term commitment it is possible to influence effective allocation of resources in a manner that is more suitable for overall crisis response management. Since by increasing the degree of familiarity and long term commitment crisis management professionals tend to be more open towards joint utilization and contribution of resources in a collective task, it is likely that these abilities improve the condition to collaborate.

From a broader perspective of crisis response management, crises cause unexpected changes in the environment that demand organizations to adapt to such changes by assuming new structures, leadership, tasks, roles and membership which are different from the traditional ones. As the research contributions demonstrated that by increasing the degree of familiarity and long term commitment, the ability of organizations to share and allocate resources are improved and organizations become more open towards collaborative efforts in a joint task in general, it can therefore be argued that these abilities shall also help organizations to adapt better to the changes caused by crises. In other words it can also be argued that, as crisis response situations
present conditions where effective resource allocation and sharing are necessary, organizations most often have to perform new tasks, assume new structures and leadership to provide new services different from their traditional ones, given such situations, higher degree of familiarity and long term commitment lead to higher motivation and willingness among crisis management professionals to be more open to joint tasks and to be more open to changes in traditional tasks, structures or type of leadership. Therefore it can be claimed that increasing degree of familiarity and long term commitment will most likely contribute to improve conditions of interorganizational collaboration.
6.2 Reflecting on validity and generalizability of the research

6.2.1 Validity

Literature on validity suggests that validity is a measure which conveys the accuracy and quality of research (Johnson, 1997). Validity can be measured or reported in several ways such as by estimating steps taken to reduce certain bias in research or steps taken during the research process that are expected to report the extent of correctness in interpretation of thoughts, views and standpoints explored in the research. Literature also suggests that in qualitative research these measures of validity can be difficult to operationalize compared to quantitative research studies (Johnson, 1997; Robson, 2002; Kaplan et al., 1976). Nevertheless, in order to report a rigorous research, discussions on measures taken to limit the threats to validity are important.

There are several ways to report validity in research depending on the type of method and approach used. Depending on the research methods used in this thesis, steps taken to address the threats to four types of validity shall be discussed, which are descriptive validity, interpretive validity, theoretical validity, internal validity and external validity.

Descriptive validity

Descriptive validity reports “the factual accuracy of the account as reported by researchers” (Johnson, 1997). To be more precise, the major question or concern addressed through this validity measure is whether what is being reported in the study actually happened. Data triangulation method is regarded as a good step to address the threat to descriptive validity (Robson, 2002). Paper I used review of international scientific literature and complemented them with semi-structured interviews limited to a specific context of civil-military collaboration. The findings from both the methods used supported the other. Thus it can be argued that the threat to descriptive validity was addressed with the help of the methods used during the process of research.

Interpretive validity

Interpretive validity reports the accuracy of the meaning attached by participants engaged in the study (Johnson, 1997). To be more precise, this form of validity measures whether the meaning expressed by participants who were engaged in the study have been interpreted accurately. Participant feedback is regarded as a good step to address the threat to interpretive validity in qualitative research. In Paper I the interviewees had the opportunity to share opinions on the questions asked during the
interview. In Paper II and III debriefing sessions were conducted on completions of the experiments and qualitative surveys where the participants could provide feedback on whether the experimental conditions constructed mirrored their real life experience. All participants in the experiment responded that the experimental conditions constructed were relevant in real life crisis response operations and that the decision choices mirrored the conditions in reality. Similarly, in Paper I majority of the participants agreed that the questions posed were open ended and that they had ample opportunity to share their experience if they wanted to.

Internal validity:

Internal validity enables a researcher to justify cause and effect relationships or identify potential cause and effect relationships (Johnson, 1997; Conway & Peneno, 1999). These measures enable a researcher to justify, connect or conclude potential cause and effect relationships to justify a phenomenon or the problem under study. Threats to internal validity are mostly relevant in the cases of Papers II and III. Several measures were taken to deal with those threats. For example, randomized procedures were used to determine the order of the experimental conditions that the participants were exposed to, and several standard statistical tests were performed so as to rule out the possibility that the observed effects were generated by chance. Within group design was employed in the experiments so that all participants in the sample were exposed to all the four experimental conditions. Friedman and Wilcoxon signed rank test were performed. Moreover, the effect size was investigated by testing for stochastic superiority (Anderson & Darling, 1952).

In addition, respondent bias is a potential threat to internal validity. Thus, a respondent might withhold information or may respond in a way that pleases the researcher (Robson, 2002; Brinkmann, 2007). Although the results from the literature review and interviews in Paper I do not aim to establish cause consequence relationships, such as in the experiments, one might still consider the identification of challenges to interorganizational collaboration and the underlying differences between organizations as a type of investigation into cause consequence relationships. However, it is important to note that in case of the interviews conducted in Paper I, it is the description provided by the respondents, in other words their perceptions those are the focus. In this sense, threats to internal validity might involve identifying challenges that are not relevant in other contexts or reality. To deal with this threat the interviews were consciously conducted in a way that provided as little opportunity as possible for the respondents to assume the intention of the researcher. For example, follow up questions with further probing were only posed when an interviewee had to share something on an issue that was perceived by the interviewee as a challenge. This design of interview was chosen to limit the possibility for the respondents to be threatened by the researcher. For example, it was clear from the beginning that there was no right or wrong answer and that the response of the interviewees would not be
used to evaluate her or him. Finally, before conducting interviews and experiments, all respondents were contacted in advance briefing them about the background of the researcher, which clearly mentioned pure academic interests with no professional exposure in the contexts of the respondents. This can be regarded as another step to establish trust and minimize any potential threat or clash of interest whatsoever that may arise in the minds of the respondents.

External validity

External validity, sometimes also referred to as generalizability, are connected to practical relevance of a study. Some of the popular strategies that report external validity or generalizability of a study are representativeness of a sample under research, relevance and implications of the problem under study, the extent to which the findings of a study can be extended to larger population, extent to which a research can be replicated in other environment with other samples using the same methods and techniques of data collection and analysis without major change in findings etc. (Johnson, 1997; Robson, 2002; Kaplan et al., 1976). In this thesis the discussion on external validity or generalizability relates to, for example, the extent that the findings from the experiments in Paper II and III are valid in real crisis management situation or the extent to which the results are valid for other groups of professionals (e.g. paramedics).

One way that the threat to external validity was dealt with in Paper II and III was to include participants from several organizations relevant for crisis management. The experiments reported in those papers involved 111 participants from four different organizations, namely police, fire and rescue services, the Swedish Civil Contingencies Agency (MSB) and the Swedish Armed forces. There are other relevant professionals, for example those from ambulance services and hospitals, who were not included as participants in the experiments. However, the four organizations included in the experiments are common in many domestic and international crisis situations. All of the participants had been professionally trained for crisis response, but they possessed a varied level of experience in joint crisis response efforts, both domestic and international.

Moreover, in the design of the experiments efforts were made to construct an experimental procedure that was perceived as relevant, i.e. similar to certain aspects of real problems, but at the same time simple enough to be conducted using pen and paper or a webpage. For example, steps similar to a priori assessment and posteriori assessment (See, Polit & Beck, 2006 and Paper II in Appendix for details) were taken. Pilot study similar to a priori assessment was conducted with a mixed group of 20 participants consisting of instructors and post graduate students in fire protection engineering and crisis management Master programs. Moreover, similar to posteriori assessment, all participants in the experiments, in case of Papers II and III, provided with their feedback on relevance of the experiments where a majority of the
participants connected the scenarios represented in the experiment with their real life experience in crisis response and decision making during debriefing sessions. Moreover, in the actual experiments the qualitative questions asked to the participants also contributed to addressing the threats to external validity. From the answers to the questions it was clear that most of the participants perceived the experiments to be reasonable representation of situations that involved difficult decision making choices that they would need to make in real crisis response scenarios. Additionally, to restrict participants in the experiments to associate themselves too strongly with any specific organization, all organizations remained anonymous for the participants, except the information that a participant’s own organization was represented by Team Blue and any other organization was Team Red.

Since the semi-structured interviews reported in Paper I only included participants who were Swedish nationals, and they were limited to civil-military collaboration contexts, it is difficult to generalize the findings to from them to other context. However, the descriptions of, for example, challenges and examples provided by the interviewees were similar to those that were identified through a systematic review of international scientific literature. Although the sample of interviewees was limited to Swedish nationals who were exposed to domestic and international contexts of civil-military collaboration, the findings from the literature review which was international in nature supported the interviews. Thus, it is likely that the problems explored are not unique to a specific context of collaboration such as civil-military, neither are they unique to national backgrounds such as Swedish but are also valid for larger population of crisis responders belonging to other organizations and nations.

Table 4: Summary on presentation of validity in appended papers

<table>
<thead>
<tr>
<th>Paper</th>
<th>Internal validity</th>
<th>External validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Interpretive, descriptive and internal validity measures through interview design, comparison of findings between interviews and systematic review of international scientific literature.</td>
<td>Realism &amp; Relevance.</td>
</tr>
<tr>
<td>II</td>
<td>Friedman test, Wilcoxon signed rank test, test for effect size on stochastic superiority, Within group design of experiment, Randomized order of experimental conditions, Open-ended qualitative answers.</td>
<td>Representativeness, Sample size, Realism &amp; relevance.</td>
</tr>
<tr>
<td>III</td>
<td>Friedman test, Wilcoxon signed rank test, test for effect size on stochastic superiority, Within group design of experiment, Randomized order of experimental conditions, Open-ended qualitative answers, Close-ended surveys.</td>
<td>Representativeness, Sample size, Realism &amp; relevance, Close-ended surveys.</td>
</tr>
</tbody>
</table>
6.3 Limitations

Limitations to the research carried out in the thesis can be listed as follows.

- **The limitation of bias:**

  Although steps were taken to minimize the potential threats to different types of validity, researcher bias and respondent bias, it is understandable that it is difficult to eliminate those completely. For example, referring to respondent bias in case of semi-structured interviews, it is difficult for interviewees to distinguish between their prejudices from observation and perception of challenges.

- **Another limitation of the study was that the semi-structured interviews conducted were with a focus of civil-military collaboration contexts only.** Although the findings from the interviews were similar to those in the literature review, semi-structured interviews extending to other collaboration contexts in crisis response management could have provided a wider empirical basis for comparisons.

- **The influence of political and national history in perception of challenges in interorganizational collaboration:**

  Although the systematic review of international literature and semi-structured interviews were compared to and corroborated for theoretical relevance and support across international scientific literature, nevertheless a comparative empirical study across nations with different political and cultural history adds wider scope for other comparisons on challenges in collaboration and coordination.

- **The influence of political and national history in response of a participant:**

  Experiments were conducted for organizations in Sweden with domestic and international experience. Similar experiments set up with participating organizations across in different countries with more variety in exposure, national history and polity can again add wider scope of comparisons across organizations. For example recent research demonstrates the possible differences in assumptions of participating organizations arising from national backgrounds and political history in joint crisis management (Kuiipers et al., 2015; Christensen et al., 2015).

- **Finally, although experiments provide controlled environment for measuring specific variables under study, nevertheless this leads to loss of details that exist in reality. Replication of reality in experiments is difficult to attain and therefore can only mirror aspects of it.**
6.4 Future research directions

The experiments conducted in Paper II and III comprised of participants from four different organizations. Comparisons between these organizations were out of scope for the current research. A study based on comparisons between these organizations will be interesting as it might provide indications on collaborative practices existing in organizations that may contribute to develop adaptive ability in organizations further. Findings from the study can contribute to improve crisis collaboration and learning in organizations to adapt better. Similar experiments when conducted in other countries can provide country wise comparisons with better scope to explore whether country specific operational practices are contributing to collaborative and adaptive behaviour. This can also contribute to learning to improve crisis management practices.

Detailed investigation into the mechanism of making decisions to extent of contribution in joint task shall offer us with great scope to understand the mechanism of interorganizational collaboration better. This will also help us find exact methods to facilitate collaborative behaviour between organizations. More research is also required to examine whether improving familiarity and long term commitment will improve overall crisis management efforts.

In Paper I, semi-structured interviews were used to capture the perception of challenges among crisis management professionals. Country-wise comparisons through empirical data were out of scope for the current research. Future research directed towards perception of challenges with comparisons across nations provide better scope to discuss and understand country specific policies, culture and practices, understand the politicization of crisis management. Crisis management and humanitarian response as a field is politicized and therefore organizational practices, culture and policies are expected to bear this character. As, these differences lead to challenges in collaboration and coordination, therefore better understanding of these differences in culture, practice and policies, which is largely affected by national history and polity, shall encourage facilitating familiarity and long term commitments in order to develop interorganizational collaboration and overall efficient organizing of crisis response through such efforts.
Chapter 7 Conclusions

Since the research questions asked in the present thesis corresponds well to the questions asked in the appended papers, most of the conclusions have already been presented in the papers and in chapter 5. Therefore, the following text is only a short summary of the main conclusions.

Challenges to interorganizational collaboration

Through a review of scientific literature complemented by interviews with crisis management professionals several challenges were identified, which were categorized under five different themes, namely organizational structure, communication, information management, organizational culture and organizational identity.

Although, several specific challenges were identified, not many of them were described with sufficient detail to determine if they have a significant influence of the practice of crisis management. Therefore, two experiments were conducted to investigate the influence of two factors on two types of decision making situations related to collaboration in crisis management operations. The two factors were the extent that a crisis management professional is familiar with the resources etc. of another organization, and the extent to which the professional expect to cooperate with the other organization in the future (ECFI).

Effect of familiarity and ECFI on resource utilization

The first decision making situation that was investigated was concerned with the extent that crisis management professionals utilize resources from other organizations in a joint crisis management operation. It was concluded that changes in familiarity and ECFI (expectation of future cooperation) or long term commitment influence the extent to which crisis management professionals choose to utilize resources from other organizations. Higher degree of familiarity and long term commitment tend to increase the extent to which resources and equipment are utilized from other organizations.

Effect of familiarity and ECFI on resource contribution

The second decision making situation that was investigated was concerned with the extent that crisis management professionals choose to contribute to a joint task that is conducted together with another organization (a joint task). It was concluded that higher familiarity led to a reduced contribution to the joint task. It can be explained by the
fact that the participants in the experiment trusted the other organization to be able to deal with the joint task more when familiarity was high. The effect of changing ECFI was not as strong as when changing familiarity. No statistical significant differences were detected in the experiment when ECFI was changed.

Final remarks

In situations where organizations are expected to share, mobilize and allocate resources or equipment across organizational borders, or share competences, knowledge and capabilities, increasing familiarity and long term commitment between organizations are most likely useful strategies to improve collaborative behaviour between organizations. Therefore, strategies in line to increase knowledge on capabilities, resources and equipment i.e. familiarization of organizations and long term commitment should be implemented in crisis planning and preparedness to improve effectiveness of crisis response management.
Bibliographic references


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APPENDIX
Challenges in coordination: differences in perception of civil and military organizations by comparing international scientific literature and field experiences

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Challenges in coordination: differences in perception of civil and military organizations by comparing international scientific literature and field experiences

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The extreme pressure resulting from modern-day disasters in terms of severe shortages of resources, mass casualties, infrastructure breakdown, large-scale damage and their impact necessitate coordination between all the agencies involved in disaster response. Better coordination in international disaster response operations will make them more effective in organizing the different phases of relief, rehabilitation and recovery. Recent disasters such as the hurricane Katrina, the Indian Ocean tsunami and the earthquake in Haiti have seen multiple civil agencies and the military working together. However, challenges have been identified in civil–military coordination. Differences in working procedures and a lack of knowledge on the other’s organizational identities resulted in stereotyping and prejudices, which are root obstacles to coordination. The aim of this study was to identify the perception-related challenges in civil–military coordination, and how they are perceived in the field by civil and military teams, and to investigate whether perception-related challenges and their implications have been reported in the international literature. A systematic literature review and 12 semi-structured interviews were carried out to answer these questions. Nine out of the 12 respondents were practitioners from the Swedish Civil Contingencies Agency (MSB) and the Swedish military, with experience of international disaster response missions that involved civil–military interactions, and 3 were trainees from Karlberg Military Academy, Stockholm, who were expected to participate in similar operations in the near future. The questions asked during the interviews were based on the systematic literature review. National backgrounds, attitudes and perceptions of the professionals towards the other organization were found to be key factors influencing civil–military coordination. This indicates that comparisons between the perceptions of professionals from both civil and military teams with different nationalities and different political histories should be carried out in future research.

Keywords: civil–military coordination; international disaster response operations; perception of challenges

Introduction

Modern-day disasters can be extremely complex due, for example, to their variety, the extent of damage and the interactions between causal factors. The twenty-first

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century has witnessed some devastating events, such as the earthquake in Haiti, hurricane Katrina, the Indian Ocean tsunami and the earthquake in Kashmir, which necessitated civilian agencies working in cooperation with the military as part of multi-agency disaster response operations (Mitchell 1999, 37, 38; OCHA 2006; Coppola 2007; SIPRI 2008). Depending on the type and extent of damage in a disaster, the variety of stakeholders involved in response operations can include local, regional or national governments, a vast range of humanitarian assistance organizations (HAOs), community emergency response teams and the military (Archer 2003). Coordination between these agencies is essential to ensure effective response; however, this is often difficult in practice (Chen, Sharman, Chakravarti, et al. 2008). Although it is a key element in disaster response, the interaction between civilian agencies and the military is often viewed as challenging (Mockaitis 2004). It is, therefore, surprising that little research has been conducted on coordination, in general, or issues related to coordination (Chen, Sharman, Rao, et al. 2008).

In response to natural disasters, a report was prepared jointly by the United Nations Office for Coordination of Humanitarian Affairs (UN OCHA) and the Stockholm International Peace Research Institute (SIPRI) in 2008 evaluating the implications of using foreign military assets in several of the major natural disasters of the twenty-first century, including the Indian Ocean tsunami in 2004, the Haiti earthquake in 2004, the Mozambique floods in 2000 and the Kashmir earthquake in 2005. Problems in civil–military coordination were identified and described as ‘persistent’ among both the civilian actors and the military (SIPRI 2008, p. 41). Owing to the large numbers of both civilian and military actors on the ground in all four of the cases mentioned above, the report identified a particular need to study civil–military coordination. Significant problems related to coherence and coordination between HAOs and the military have also been reported in the vast majority of peacekeeping operations (deConing 2008, 3; deConing and Friis 2011). These were attributed to different cultures and priorities, as well as different standard operating procedures, codes of conduct and rules of engagement (OCHA 2003; SIPRI 2008, 41). Lack of knowledge concerning the organizational identities of other agencies can lead to stereotyping and prejudices, which are root obstacles to civil–military coordination (Mockaitis 2004; Haugevik and deCarvalho 2007).

Studying professionals’ perceptions of different organizations contributes to our knowledge on goals, attitudes and identities of organizations. It helps in understanding the challenges arising from differences between civil and military organizations and their perceptions or prejudices and stereotypes that these organizations hold for each other. This can reduce friction or problems of trust, which are likely to influence coordination between different groups working together in a crisis situation. The uncertainty and extreme pressures of emergencies make it necessary for these diverse groups to cooperate and communicate with each other well, as these are key to efficient coordination.

Response to natural disasters and peacekeeping operations may differ considerably depending on the type of organizations involved and how they operate. However, the UN 2003 guidelines define humanitarian assistance as: ‘aid to an affected population that seeks, as its primary purpose, to save lives and alleviate suffering of a crisis-affected population’ (OCHA 2003). Here, no clear distinction is made between response to natural disasters and peacekeeping operations, as humanitarian assistance encompasses both these activities. The present study includes international disaster response missions where, regardless of the type of response operation
(e.g. peacekeeping operation or response to natural disasters), similar challenges were perceived by civil and military teams. This was achieved through a systematic literature review and empirical data obtained from interviews.

The present study explored the challenges perceived in the context of civil–military coordination. The study identified research carried out on challenges perceived, through a systematic literature review, and compared them with perceptions of professionals in the field, belonging to civil and military organizations. The primary research question addressed in this study – the extent of scientific studies in challenges to civil–military coordination – was answered by identifying specific challenges in civil–military coordination through a systematic literature review. The secondary research question – do the challenges identified in the literature review differ from those in the empirical data? – was answered by comparing the findings from the literature search and the interviews.

The paper starts with the definition of civil–military coordination. This is followed by a description of the research methodology, the design of the study and the systematic literature review. The results of the literature review and the empirical study are then presented and compared. This is followed by a section on discussion and conclusions and finally suggestions for future research.

**Defining civil–military coordination**

Hall defines coordination as, ‘the extent to which organizations attempt to ensure that their activities take into account those of other organizations’ (Hall et al. 1977, 459). As disaster situations bring together a number of actors, McEntire suggested that coordination is the ‘harmonization of activities among diverse actors’ (McEntire 2007, 291). Coordination can also be understood as ‘aligning one’s actions with those of other relevant actors and organizations to achieve a shared goal’ (Comfort 2002). The above definitions suggest that challenges in coordination may arise from the problems encountered in any kind of activity which different organizations (e.g. civilian agencies and the military) may perform together, which require cooperation between them to achieve a shared goal.

Civil–military coordination and civil–military cooperation are two different terms that have been used to define similar operations (NATO 2000, 2002; EU 2002). Since the 1990s, civil–military cooperation or CIMIC is a concept (first used by NATO) which has been defined in different ways by actors such as NATO, the EU, several European countries including Canada and the US, meaning more or less the same thing (deConing 2005, 2008; deConing and Friis 2011). Around the same time in the 1990s, different international and political bodies began to use another term, civil–military relations (CIMIR). The UN OCHA also coined a new term called UN CMCoord around the same time. Primarily, due to the debatable definitions of the terms and concepts and lack of consensus in formulating them uniformly, new terms were introduced by different political and international bodies to meet their needs. For easy understanding and reading of this paper, the term civil–military coordination will be used for the rest of the paper.

**Methods**

The study can be divided into two main parts: a systematic literature review and interviews conducted to obtain empirical data. The systematic literature review was carried out to investigate two issues:
• the amount of research on challenges to civil–military coordination published in the scientific literature and
• the thematic coverage of these challenges to civil–military coordination or the classification of challenges to civil–military coordination under major themes.

Empirical data were collected to determine whether civil and military professionals acting in the field identified challenges to civil–military coordination similar to those found in the literature, and whether these could be classified under similar themes.

The systematic literature review

The systematic literature review was performed by doing a structured search using the database Scopus available as an online platform in Lund University library database. The search and the filtering process after the retrieval of resources were inspired by PRISMA (Moher et al. 2009). The rationale for using a structured search similar to PRISMA was to identify the studies on civil–military coordination reported in the scientific literature (refers to articles published in international peer-reviewed journals), the motivations behind the studies and the topics covered.

Based on the research questions, a number of keywords were chosen for the search queries in the structured search (Appendix 1). A total of 36 successful combinations were identified after excluding search queries resulting in over 500 hits. The steps followed in the structured search are described below.

Filter process 1 – identification

In this step, a combination of keywords included in the search query was entered in Scopus. The combination of words within a search query was treated as a phrase. Peer-reviewed journals were searched, and the article was included if the search query was found in the abstract, title or keywords. It should be noted that when a search query returned over 500 hits or results, it was regarded as being invalid due to too high number of returned hits. Those searches were then repeated using the ISSN numbers of specific journals to limit the search results to 500. The articles were screened and their relevance determined, as explained below. This procedure was adopted to maximize the probability of including all peer-reviewed articles covering civil–military coordination and related issues. The criteria used to filter a relevant article are discussed in the second and third filtering steps.

Filter process 2 – screening

The 2522 articles obtained from the series of 36 search queries were filtered based on the abstracts. These are called relevant results. The total number of relevant results returned was 171. The relevance of an article was based on whether the article covered civil–military coordination as a concept under interorganizational coordination and if the article included challenges to interorganizational coordination.
Filter process 3 – eligibility and screening

Of these 171 results, duplicates were removed, reducing the number to 145. All 145 articles were read in full to further assess their relevance. The number of articles remaining was 74. The relevance of these articles was further determined based on whether they included challenges specific to civil–military coordination.

Unstructured search

Some relevant articles were also identified by cross-referencing or by searching for a particular author. This list was compared with the 74 titles obtained from the structured search in order to remove duplicates. All these articles were read in full and were retained if considered relevant. The final number of relevant articles in the unstructured search list was 34. The total number of articles reviewed in the scientific literature was 108, including the structured and the unstructured search.

Empirical data

Twelve semi-structured interviews were conducted to collect empirical data. The interviewees had taken part in international disaster response operations providing either humanitarian assistance following natural disasters or in peacekeeping operations in a disaster setting, involving civil–military coordination. The interviewees were selected based on their availability when asked to participate in the study and, it was a conscious decision to include equal number of interviewees from civilian agencies and military. Half of the interviewees worked for the Swedish Civil Contingencies Agency (MSB), which is the largest Swedish civil responder to disasters. It is a governmental body, and has been closely associated with several EU crisis management missions. The collaboration between the MSB and the EU in international disaster response operations was of interest in this study, as new EU legislation is aimed at better civil–military integration. The interviewees from the MSB were liaison officers or project officers who had participated in coordination meetings in the field in international disaster response missions. The other six interviewees were from the Karlberg Military Academy in Sweden. Three out of six of this group had already taken part in international disaster response missions, while the rest were undergoing field training. On completion of their training, the latter group would become available for such missions.

Semi-structured interviews allowed to include ‘subjective theories’, spontaneously mentioned by the interviewees while answering open questions (Flick 2006). The intention was to not influence the interviewees by asking questions about specific challenges identified in the literature, but instead to let them talk about their experiences and voice their opinions concerning civil–military interactions in a less controlled manner. Their responses were then analysed to determine whether the specific challenges identified were similar to those found in the literature. Therefore, the first part of the interview was conducted using general questions regarding the interviewees’ experiences and perceptions regarding civil–military interactions. However, since it was also deemed interesting to gain knowledge of the interviewees’ opinions concerning the themes identified in the literature, the second part of the interview focused on these themes. If, for example, a specific interviewee mentioned that she/he believed that language and terminology constituted a major
challenge to civil–military interactions in the first part of the interview, that theme was not included in the second part unless the interviewee had more to say on the subject.

The interviews were conducted personally or on Skype, based on the availability of the interviewee. All interviewees received the same instructions and information on the objectives of the study one day before the interview. All the interviews were recorded and transcribed with the consent of the respondents.

The responses obtained in the form of different views and perceptions were compared to the themes that had been identified from the literature review. This method is similar to thematic coding, and has also been described as a mixed approach (Flick 2006; Blaikie 2009).

Results

Findings from the systematic literature review

Contributions in the scientific literature and grey literature

Of all the literature identified in the systematic literature review as dealing with civil–military coordination, only 15% was published in scientific peer-reviewed journals, meaning the scientific literature. The remainder was grey literature, i.e. conferences, internal reports, guidelines, policy reports, journals which were not peer-reviewed or open source in nature, meeting updates from various international agencies under UN, EU or NATO and independent organizations like Overseas Development Institute, SIPRI, International Federation of Red Cross and Red Crescent Societies, etc.

Distribution of topics in the scientific literature

Of the scientific literature, 38% consisted of studies on interorganizational coordination and 38% on organizational theory, while 16% of the studies included challenges in civil–military coordination. The remaining 8% was concerned with the ideological debate on military involvement in humanitarian operations under civil–military coordination. Figure 1 shows the distribution of topics identified in the systematic literature search dealing with civil–military coordination.

![Figure 1. Distribution of topics identified in the systematic literature review.](image-url)
Thematic representation of challenges in civil–military coordination identified in the systematic literature review

Specific challenges were identified in some cases where civil and military teams had to coordinate with each other. These challenges can be categorized under broad themes indicating the type of differences between civil and military teams which can lead to specific challenges. Thus, one or more types of difference may result in one or more specific challenges in coordination between civil and military teams. The themes identified are not rigid compartments, and there may be significant overlap. The themes or types of differences identified are communication, information management, organizational structure, organizational culture and organizational identity. Figure 2 illustrates these broad themes and their interconnectedness. Although these themes are interconnected, however, one of the themes that find a common overlap with all four is the organizational identity. As international humanitarian response is becoming increasingly politicized, the gap between civil and military teams has also grown; therefore, tasks and priorities for these teams also differ as political influence on them often pulls them in opposite directions rather than same (Granot 1997; Pugh 2001; Metcalfe, Haysom, and Gordon 2012). It should be noted that political history also plays a major role in determining the attitudes of civil and military teams towards each other and the relation between them. In addition to the problem of politicization, different cultures, goals and approaches also lead to fundamental differences in identity and ideology (Granot 1997; Weiss 1997; Pugh 2001). Organizational identity is one such theme which captures these differences related to political background, political history and perception of attitudes, values and ideologies. Therefore, the area of common overlap is best portrayed by the theme named organizational identity (Figure 2), which emerges as a central theme to the other

![Figure 2. Thematic representation illustrating the interconnectedness of the four themes identified in the systematic literature review on civil–military coordination.](image-url)
themes; in other words, other differences which can be classified into four different themes arise from the central theme called organizational identity.

Summary of the findings of the systematic literature review

Table 1 provides a summary of the findings from the systematic literature review. Although the summary lists some of the factors which may be relevant for coordination in general, nevertheless these factors also have positive or negative effects specific to civil–military coordination. Factors that have a positive impact on coordination are called facilitators, while those with a negative impact are called inhibitors (Alexander 1995, 15). Interestingly, facilitators and inhibitors mirror each other, meaning they are exactly opposite to each other. In other words, if factors

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<td>Flexibility; formalization</td>
<td>No clarity on whom to contact for a particular information in a hierarchy; whom to send to which meeting</td>
<td>Soeters and Recht (1998), Rietjens et al. (2009), Ödlund (2010), Salmon et al. (2011)</td>
</tr>
<tr>
<td>Organizational culture</td>
<td>Flexibility in approaches and/or decisions; formalization; standardization</td>
<td>Different treatment to same information; different treatment to same meeting; different treatment to other’s goals</td>
<td>Soeters and Recht (1998), Feaver and Kohn (2000), Pugh (2001), Weinberger (2002), Tierney and Bevc (2007), Engdahl (2009), Rietjens et al. (2009), Ödlund (2010)</td>
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</table>
listed under facilitator fail to facilitate coordination, it can limit coordination, thereby turning to inhibitors (Alexander 1995, 15). Table 1 has four columns. Column 1, with heading ‘themes’, highlights the five broad themes under which certain facilitators or inhibitors to civil–military coordination can be classified. The corresponding list of facilitators and inhibitors can be seen in Column 2. Column 3, with heading ‘examples’, lists different types of challenges or examples of challenges corresponding to Columns 1 and 2. Thus, Column 3 lists the challenges, while Column 2 provides the list of facilitators that can be used to overcome those challenges; both Columns 2 and 3 can be classified under the broad themes from Column 1. Finally, Column 4, with heading ‘sources’, lists the citations from the systematic literature review that list such challenges.

Understanding facilitators and inhibitors in the context of interorganizational coordination relevant to improve civil–military coordination

Several inhibitors and facilitators or interorganizational coordination have been identified by Alexander (1995). Some of them being structural similarity or difference, decentralization, organizational norm to coordination, standardization, socialization, flexibility, similarity in needs, resources, services, goals, operations and tasks or their difference, specialization, informal contacts and exchange of resources, information exchange, relation of actual needs, benefits and rewards or threats, costs and losses, attitudes, historical relations with other organizations, interdependence, etc. (Alexander 1995, 15).

Socialization, for example, is a facilitator. Socialization in organizational context refers to a proactive strategy that allows individuals to modify their behaviour, to adjust to new roles as opposed to the restrictive task or role previously assigned (Van Maanen and Schein 1979; Jones 1986; Ashforth and Saks 1996; Lalonde 2010). Crises are unexpected events which cannot be responded to with the restrictive set of rules or procedures or routines (Rosenthal, Charles, and Hart 1989; Lalonde 2010). The proactive strategy of socialization plays a significant role in the context of crisis because it enables individuals to get adapted in new environment which they have not ‘mastered’ (Louis 1980; Lalonde 2010). Socialization enables individuals to adapt to new roles, explore strategies to counter such situations and develop cooperative attitudes by utilizing informal channels to find solutions (Lalonde 2010).

Similarly, greater flexibility is another facilitator to interorganizational coordination. Flexible procedures allow room for innovation and the recognition of interdependence, whereas strict structures and formalization of roles and procedures limit coordination (Alexander 1995, 6; Hatch and Cunliffe 2006, 111). This has particular salience in the context of crises as crises are often described as unexpected events. In their work on organization structures, Hatch and Cunliffe (2006) refer to horizontal coordination as a necessity in unstable environments (Hatch and Cunliffe 2006). This suggests that better flexibility and horizontal coordination can improve interorganizational coordination.

Present-day disaster response operations are increasingly unstable and complex in that the demands of the situation are constantly changing, depending on the intensity of the disaster or the current phase: immediate rescue and evacuation, relief and response or post-disaster recovery and reconstruction. If we consider an example of peacekeeping forces deployed in a natural disaster setting, instability and complexity can be further increased as a result of armed combat. The role of the military may
change from peacekeeping to counter-insurgency then, depending on the intensity of the fighting. Thus, the deormalization of tasks and procedures and greater flexibility are required to meet changing demands in an unstable environment, rather than an organization with a vertical hierarchy, which cannot alone meet all the needs in a certain situation (Lawrence and Lorsch 1967). Several scholars on interorganizational coordination have also argued that formalization, standardization and strict adherence to procedures hinder intervention and interaction in emergencies while novel strategies may be needed for effective coordination between different kinds of organizations (Alexander 1995, 15, 17; Kreps and Bosworth 2007, 306; Lalonde 2010). Thus, we see how facilitators like socialization, deormalization and flexibility although relevant for interorganizational coordination in general, nevertheless contribute to improving civil–military coordination. More facilitators and inhibitors of civil–military coordination are discussed below in the discussion section, together with recommendations for reducing these challenges and suggestions for future research directions. To reduce the challenges in civil–military coordination, it is thus important to minimize the number or effects of inhibitors and maximize those of facilitators.

Findings from the literature review also indicated that there is a lack of the scientific literature and empirical studies primarily on how better civil–military coordination can contribute to improve humanitarian outcomes and also the extent to which present international frameworks and guidelines help to improve civil–military coordination in joint response operations. Metcalfe, Haysom, and Gordon (2012) in her study concludes that although several international frameworks, guidelines and standard operating procedures have been developed, however, these have not been evaluated in the field which has resulted in cases of non-adherence to these guidelines, failure of civil–military coordination and lack of coherence (Metcalfe, Haysom, and Gordon 2012). Disaster response operations are complex, and geographical details and needs in the field cannot always be defined prior to the event. It is therefore essential to pay attention towards outcomes of such international guidelines which are in effect under different political conditions and disaster situations because such systematic studies can contribute to improved civil–military coordination and achieve better humanitarian outcomes that may result from such improved coordination. For example, the Oslo Guidelines and the MCDA (the use of Military and Civil Defence Assets) Guidelines do not specify how the relationships or expectations of international humanitarian actors and the military should change when security situations change in a disaster setting (OCHA 2003; IASC 2004; NMCG 2011). As a result, these guidelines are followed to different degrees in different countries (SIPRI 2008). Alternatively, evaluations of such international guidelines in different contexts and countries can identify both privileges and problems of these guidelines on field, which can be used to improve civil–military coordination, and thereby achieve better humanitarian outcome through such joint response operations.

Findings from the empirical data

This section identifies several differences between civil and military teams, captured from the interviews, which can also be categorized under similar five themes we found in the systematic literature review. The themes are presented in the same order as in Table 1, which summarizes findings from the systematic literature review, to allow easy comparison. The themes identified from the interviews are:
communication and information management, organizational culture and organizational identity. However, there is only one difference that we can find between the findings from the systematic literature review and the interviews. We merge two themes together to one in the findings from the interviews, namely, communication and information management, when we discuss the challenges of civil–military coordination under these two themes. The reason is discussed under the discussion and conclusions section below. This also suggests that findings from the empirical data are in line with those from the systematic literature review and provide empirical support to those five major themes identified in the scientific literature. We have already seen in the findings from the systematic literature review that a number of differences between civil and military teams could be listed under one theme. Further, due to the interconnection of themes, often there may be similar differences listed in more than one theme, similar to the findings from the systematic literature review. Some of the themes are exemplified by excerpts or quotes from the interviews, which are relevant for that particular theme that may correspond to a number of differences or challenges. The excerpts also demonstrate how the same challenge can result from more than one theme.

**Communication and information management**

Information sharing was expressed as a challenge. As a researcher, it was observed that differences in priorities led to problems in information sharing. While some information was treated as key by one organization, the same information may not be key for the other, unless the priorities were discussed. However, when opportunities were given to share the operational significance of specific information through coordination meetings, information sharing became considerably easier. Most interviewees from both civil and military organizations had the perception that information sharing through informal networks lower down the hierarchy was easier than formalized information sharing.

Information sharing was a challenge due to differences in the use of terminology. This also had an impact on operational routines. Terminology that was an integral part of an operational routine for the military could be completely new to their civilian counterpart. Thus, a common understanding of terminology is essential in joint operations.

To summarize communication and information management, differences in terminology had an impact on operational routines, and the major challenges perceived were information sharing and overall communication among both sides. The specific challenge of ‘different treatment of the same information by different teams’ is common to the theme organizational culture in Table 1. This explains the interconnectivity of themes and similar challenges in different themes. Other specific challenges mentioned above like differences in use of terminology between civil and military teams, which emerged from the interviews, fall in line with the findings from the literature review under the themes communication and information management (Table 1).

**Organizational structure**

Differences in hierarchies, leadership and the general structure of organizations resulted in challenges to overall communication between both sides and challenges
in terms of operational routines. In examples given by a few Project Officers from MSB taking part in UN operations, it was stated that coordination meetings provided opportunities for open interaction with the military. Sending a low-ranking professional from the civil organization, compared to that in the military, to such meetings often sent the signal to the military that the meeting was not very important. This was often not appreciated by the military team in the field, which led to challenges in the interaction between the two kinds of organizations. Thus, similar meetings perceived differently by civil and military teams led to challenges in overall interaction between them. Examples from the literature review mention similar differences leading to a similar challenge, which can be seen in Table 1 (‘whom to send to which meeting’ in Column 3, corresponding to theme organizational structure in Table 1). ‘Different treatment to same meeting’ is also included as a specific challenge under the theme organizational culture in Table 1, which indicates that a similar challenge may arise from different themes. The quotation below clearly reflects the perceived difference in terms of organizational structure and leadership:

… It was a matter of bringing two cultures (referring to the two different organizations, namely civil and military) together. Neither side was aware of the structures or clear about the leadership of the other. And no-one bothered to explain the structure or operational significance. (Project Officer, MSB, UN OCHA relief operation, Pakistan floods, 2010)

Organizational culture

Differences in goals and priorities and a lack of understanding of these resulted in challenges to information sharing and overall interaction between civil and military teams. However, when these differences were discussed in terms of priorities of operation, tasks and goals, interaction and information sharing improved considerably in the field. Similar challenges, identified from the literature, can be found under this theme in Table 1. The quotations given below illustrate how different interviewees expressed differences in goals or priorities, and how these led to challenges.

… Peacekeeping forces are military; they don’t always understand the humanitarian side of things. The government and the (peacekeeping) forces were planning to shut down education for weeks! It was obvious that the military side doesn’t understand the humanitarian side of things (humanitarian operational significance). (Liaison Officer, MSB, UN Peacekeeping Operation, Afghanistan, 2010)

… The reason for coordinating with the military is often not understood (by humanitarian workers in the field). A military CIMIC officer coordinates with his or her humanitarian and civilian counterparts as a part of following orders from the person in command. But from the humanitarian perspective, I only coordinate with the military when those I’m trying to help will benefit from it … so the military has to understand and acknowledge this security issue. They (CIMIC officers from the peacekeeping forces) say come to us, we provide security. But when we (civilians/ personnel from the MSB), with UN markings are spotted working with the military, they (the rebel groups) start abducting children and throwing stones at women. In most cases, the military would typically have a CIMIC officer who coordinates with their civilian counterparts. From my experience, a humanitarian background (referring to the CIMIC officer from the military that, in most cases, has a military background) helps in understanding the humanitarian operations. (Project Officer MSB, UN peacekeeping operation, Afghanistan, 2010)
Organizational identity

Differences in the perception of each other’s organization and attitudes in general stem from the differences that exist between civil and military teams. Therefore, this has been categorized under organizational identity. Majority of interviewees stated that, differences in their perceptions of each other, the attitude of one organization towards the other in general, and the backgrounds of the professionals involved, influenced openness and trust. This resulted in prejudice and problems associated with trust, information sharing and communication among both sides. The political and military history of the respective countries from which the civilian and military personnel came from, also affected the general perception, attitude, openness and trust of civil and military teams towards each other. The systematic literature review bears similar conclusion. Citations listed from the international scientific literature highlight fundamental differences arising from difference in political history and national backgrounds (Column 4, corresponding to organizational identity in Table 1). This indicates that countries with a peaceful, neutral political history would tend to have more trust in the military. Professionals with such national backgrounds, for example, those from Sweden, would have a more positive attitude and find it easier to share information, interact and coordinate with the military, and vice versa, than some of their European or American counterparts. The first two excerpts below are examples of how differently a civilian team perceives a military team and international defence forces as an organization, while the third one reflects a difference in attitude due to political history.

‘… Depends on the attitudes of people as usual, of course. How you approach people. It also depends on how you present your case. But as long as they (the peacekeeping forces) are ready to listen and understand what you have to say, in my experience, we can find a solution. It (mutual perception) was based on prejudice and misunderstanding. We had to find ways of finding win-win situations’ (indicating negotiations with the peacekeeping forces). Things can always improve, it (coordination) was never 100%. (After the meetings and negotiations between the peacekeeping forces and the humanitarian organizations facilitated by the Liaison Officer), at least people were talking to each other. We (the peacekeeping forces and the humanitarian organizations) were organizing convoys together which was not happening before. Negotiations went well finally. Our opinion, that education should not be affected, was understood.’ (Liaison Officer, MSB in UN peacekeeping operation, Afghanistan, 2009)

‘… Most civilians we interacted with during the operation (civilian team with which the peacekeeping force was working) say the military is pure evil.’ (Soldier, International EU peacekeeping forces, in Afghanistan, 2009)

‘… Sweden has had peace for over 100 years. There is a lot of trust in the military. So speaking on behalf of the MSB and the Swedish Armed Forces, they are much more open minded. But in UN or EU operations, it becomes different. Although we are wearing MSB caps and goggles, we are supposed to coordinate with others (meaning other professionals from civil teams like governmental agencies of the host country and INGOs from different countries) and the military … And for some (referring to civilian professionals from different countries, other than Sweden), the military is pure evil …’ (indicating perceptions of professionals from different countries). (Project Officer, MSB, UN OCHA relief operation, Pakistan floods 2005)

Discussion and conclusions

The primary research question addressed in this study – the extent of scientific studies in challenges to civil–military coordination – was answered by identifying
specific challenges in civil–military coordination through a systematic literature review and categorizing these challenges under major themes. The five major themes that emerged from the literature review were communication, information management, organizational structure, organizational culture and organizational identity. The secondary research question – do the challenges identified in the literature review differ from those in the empirical data? – was answered by comparing the findings from the literature search and the interviews. This suggested that the systematic literature review and interviews identified similar challenges under similar themes. The empirical findings (excerpts from interviews) also indicated the types of differences between civil and military teams that resulted in challenges specific to the context of civil–military coordination.

One difference that was identified between the scientific literature and empirical data was the types of challenges expressed under the themes communication and information management. The types of challenges expressed by interviewees were common to the themes communication and information management and were thus merged together due to high commonalities. On the other hand, clear differences were identified in the types of challenges arising from these two themes in the literature review. For example, interviews indicated use of different terminology in civil and military organizations as a challenge in communication, while different treatment to same information as a common challenge in both communication and information management. On the other hand, the scientific literature mentioned different ways of collating information or using different databases which are more relevant in terms of managing information and challenges arising due to different ways of managing information which are distinct from those challenges in communication. Nevertheless, merging of two themes, namely communication and information management, emerging from interviews illustrates how similar challenges could arise from different themes or different challenges could arise from same theme. Therefore, it was concluded that the differences between civil and military organizations identified in the scientific literature and interviews reflect the interconnectedness of themes.

An additional interesting observation from the interviews was that both civil and military teams shared similar opinions on differences between these two organizations that lead to challenges in civil–military coordination. Both civil and military teams expressed similar challenges arising from similar differences that could be analysed under similar themes.

The empirical data were obtained by interviewing Swedish field professionals who had been deployed in disaster response operations internationally or had undergone similar training and waited to be recruited in such international operations in near future. It is therefore necessary to discuss the generalizability and validity of the findings internationally. The aim was not to limit the study to any particular nation in terms of civil–military coordination in disaster response operations, but to investigate civil–military coordination as a topic in the scientific literature available internationally. Therefore, the systematic literature review which is one part of this study looks at the international literature available on civil–military coordination. Having considered that, if we now look the findings, both the scientific literature and interviews indicate homogeneity in culture in military teams deployed in disaster response situations, despite differences in political history and national backgrounds (Soetters and Recht 1998; Soetars, Winslow, and Weibull 2006), and the majority of the challenges identified from interviews could therefore be compared
and categorized under similar themes to those found in the systematic literature review. However, the literature review also indicates that differences in mutual perception and trust among civil and military teams which may stem from political history, could have an impact (Sullivan and Transue 1999; Luhmann 2000). The interviews also provided evidence that the attitudes among civil and military teams are more open, trustful and positive when a nation has had a comparatively peaceful and neutral political history. Thus, we see that the findings from the systematic literature review and those from the interviews fall in line with each other, similar differences were identified which could be classified under similar themes, although those interviewed were Swedish nationals, trained for and exposed to international joint crisis operations and experiences from civil–military coordination in the field. Nevertheless, it may also be interesting to compare the findings and conclusions in terms of difference in perception of civil and military teams from countries with different political histories. This opens up possibilities for future research.

As a researcher, it is difficult to remain unbiased when the scientific literature available internationally, at its outset, describes civil–military coordination in general as a challenge. From the standpoint of the interviewees, it is difficult to share experience from disaster response operations and separate it from their prejudices of how they perceived the challenges encountered in civil–military coordination. Fundamental differences in perception and attitude stem from the ideological orientation of humanitarian actors and the military (Weiss 1997; Pugh 2001). Debates on the protection of humanitarian space, the dilution of humanitarian boundaries and the politicization of humanitarian response highlight further differences between civil and military teams (Pugh 2001; Tierney and Bevc 2007).

**Directions for future research**

An important factor identified by the interviewees was the need for continuous communication and discussions on the priorities of tasks. As a result of changing situations, both humanitarian and military actors kept changing, as did their roles in disaster response operations. Adapting to these changing organizations and their roles was often perceived as a challenge in coordination. In fact, the scientific literature also suggests that such continuous updating of each other’s tasks, operational significance and priorities could contribute to improving the efficiency of civil–military coordination. Comfort (2002) argues for the need of continuous updating of information in situations where multiple actors are dependent upon each other to achieve their goals. A uniform system of documenting information is key to overcoming the differences in communication, terminology, training and infrastructure between multiple actors in emergency response (Comfort 2002). Interviewees also suggested a platform for dialogue, where the attitudes, internal beliefs and norms of organizations are shared, structures and hierarchy are understood and the operational significance of the corresponding organization is conveyed. Joint training exercises aimed at improving civil–military coordination may also help overcome some challenges. In the scientific literature, we also find support of this, which is similar to the concept of socialization (Bouckaert, Peters, and Verhoest 2010) as a facilitator of better coordination among teams. Although both interviewees and the scientific literature indicate these potential steps that can be taken to overcome challenges to civil–military coordination, however, few empirical studies or studies directed towards evaluation have been conducted that cover the aspects of impact of
continuous information updates and socialization on civil–military coordination and its outcomes. This provides ample scope for future research in these directions to improve and evaluate civil–military coordination.

Acknowledgements
I would like to thank my interviewees from Swedish Civil Contingencies Agency (MSB), Sweden and Karlberg Military Academy, Stockholm, for their patience, time and cooperation, my supervisors Henrik Tehler and Henrik Hassel for their timely insights. I shall also thank the reviewer for invaluable comments that make this paper a success and TRRC for funding this study. Finally, I would like to thank my father for being a constant motivation in my life, without whom this paper would remain incomplete and my dear Jishnu for his practical help with the paper whenever I asked for.

Disclosure statement
No potential conflict of interest was reported by the author.

Notes
1. Scopus: Largest abstract and citation database of peer-reviewed literature covering the fields of science, medicine, technology, social sciences, and arts and humanities, with 53 million records, 21,915 titles and 5000 publishers. Source: http://www.elsevier.com.ludwig.lub.lu.se/online-tools/scopus.
2. PRISMA: Abbreviation for Preferred Reporting Items for Systematic Reviews and Meta-Analyses. It is a systematic way of reporting scientific literature. It was developed in 2009 and was first used in the field of medicine.

References


Lawrence, P. R., and J. W. Lorsch. 1967. Organizations and Environment: Managing Differentiation and Integration. Boston, MA: Division of Research, Graduate School of Business Administration, Harvard University.


Appendix 1.

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NO RELEVANT RESULTS ON FILTER PROCESS 3 (ELIGIBILITY & SCREENING)

RELEVANT RESULTS ON FILTER PROCESS 3 (ELIGIBILITY & SCREENING)

Total: 2522 articles
Modern day crises demand organizations to collaborate and adapt to new roles, functions and structures. In such situations, lack of collaborative behaviour and openness between organizations can result in reduced adaptive ability. Therefore, it is important to facilitate collaboration between organizations. We have studied the extent to which crisis managers are prepared to work with personnel and resources from organizations other than their own when responding to crises. An experiment was designed with four different organizations in Sweden, which involved decision making concerning whether the participants systematically favoured their own organization over others. Findings indicate that increasing familiarity and expectation of future cooperation with other organizations increased the likelihood that decision makers would be prepared to work with other organizations in joint crisis management.

1. Introduction

Major crises are seldom restricted to geographical or organizational boundaries but are often ‘transboundary’ in nature, affecting many stakeholders and functional sectors (Ansell, Boin, & Keller, 2010; Hart, Heyse, & Boin, 2001; Ödlund, 2010; Perry, 2007). Although each organization responding to the crisis have their specific mission, they often find themselves dependent on others to achieve their respective goals (Boin, 2004; Boin & Hart, 2007; Hart, Rosenthal, & Kouzmin, 1993; Uhr, Johansson, & Fredholm, 2008; Van Santen, Jonker, & Wijngaards, 2009). Therefore, managing such events naturally involves collaboration and coordination among several organizations. Moreover, it often requires the organizations to take on new tasks under new organizational structures (Boin & McConnell, 2007; Drabek & McEntire, 2003; Dynes, 1970a, 1970b; Dynes & Aguirre, 1979; Dynes & Drabek, 1994; Dynes & Quantrrelli, 1970, 1976; Paraskevas, 2006; Quantrelli, 1988). However, since people are usually more comfortable in their existing routinized structures and functions, this can create organizational strain resulting in problems of collaboration and coordination within and across organizations (Britton, 1988; Drabek et al., 2003; Dynes, 1970a, 1970b, 1994; Dynes et al., 1976, 1979; Dynes, Quantrrelli, & Kreps, 1972). The strain might reduce the ability of the organizations to adapt to changing situations in crises and it is therefore important to seek ways to help crisis management professionals adjust to new roles and tasks.

One way to investigate factors that might inhibit or facilitate the adaptive ability of organizations is to examine the nature of the situations that the personnel
working with crisis management might find themselves in. For example, in crisis response it is likely that crisis management professionals will have to work with personnel and resources from other organizations than their own. A recent forest fire, that turned out to be the largest fire in Sweden in 40 years, is a good illustration of such a situation. The local rescue service organization was unable to manage the situation singlehandedly and therefore the County Administrative Board (CAB) of Västmanland (a region in Sweden) had to assume responsibility for the operation. The CAB, was recruited from elsewhere in the country and put in charge of three local rescue services. The result was a new organizational structure populated by people from several rescue service organizations. Although the CAB assumed formal control over the rescue services, they were not formally in command of the police. Nevertheless, in practice, the police were at the disposal of the commander of the CAB operation. This means, that the CAB commander not only had to decide when and how to utilize personnel and resources from several organizations that were under formal command, but also decide the same for organizations that were not under formal command (such as the police). The case illustrated by the forest fire, i.e., a situation in which a crisis management professional has to utilize personnel/resources from other organizations under formal or informal command, has been observed in several other recent crises. See for example the descriptions of the 1985 Earthquake in Mexico City by Dynes, Quarantelli, and Wenger (1990); the Fort Worth Tornado in 2000 by McEntire (2002); the Indian Ocean Tsunami in 2004 by Birkmann, Buckle, Jaeger, Pelling, Setiadi, Garschagen, Fernando, and Kropp (2010); the Victorian bushfires by Leonard and Howitt (2010); and the 9/11 attacks by Helsloot and Ruitenberg (2004), Voorhees (2008). In fact, it is a common situation in modern crisis management (Aiken & Hage, 1968; Batho, Williams, & Russell, 1999; Drabek, 1985; Drabek et al., 2003; Majchrzak, Sirksa, & Hollingshead, 2007; Quarantelli, 1988; Quarantelli & Dynes, 1970, 1977; Scanlon, Helsloot, & Groenendaal, 2014; Stallings & Quarantelli, 1985).

Therefore, factors affecting the extent to which crisis management professionals are prepared to work with personnel/resources from other organizations than their own are likely to influence the ability of responding organizations to adapt to new organizational structures or functions. The present paper is an attempt to better understand such factors that might inhibit or facilitate the formation of extending and emergent organizational structures. We designed an experiment involving 111 crisis management professionals in decision-making roles. The participants in the experiment were presented with a situation in which they could choose to utilize units from their own or another organization to respond to a crisis. We use the experiment to test the effect of varying two factors related to the choices made by the participants. The effect is measured in terms of the extent to which the participants were prepared to utilize units from the other organization. The first factor is called expectation of cooperative future interaction (ECFI) and is related to whether the participants expect to cooperate with the other organization in future while the second is familiarity which is related to whether they are familiar with the capabilities of the units from the other organization.

The paper begins with a brief background, followed by a discussion of the theoretical basis of the study. This leads to two hypotheses concerning how changing ECFI and familiarity will affect the extent to which a decision maker is prepared to use units from another organization in a crisis management context. These hypotheses are then tested in an experiment, described in the next section. The results are then presented and, finally, we discuss their implications and the conclusions that can be drawn.

1.1. Background

Human behaviour associated with social in-groups and out-groups is well established in social psychology and organizational behaviour. It is relevant in many areas involving communication, coordination and collaboration across groups, social or demographic entities or organizations (see Ashforth & Mael, 1989; Hogg & Terry, 2000; Terry, Hogg, & McKimmie, 2000; Smith & Terry, 2003). It is also relevant in our study since we are interested in situations where decision makers find themselves in new organizational structures where they might have to work with or utilize resources or personnel from other organization than their own. More precisely, we are interested in the extent to which a decision maker systematically favours the utilization of resources/personnel or units from his/her own organization over others in a crisis management operation, even though the units are identical except for the fact that they belong to other organizations. We call this organizational in-group bias and based on previous studies (see references above), we expect it to be strong. In a previous experimental study, Ekman (2012) found that in a civil/military crisis management context, the participants were more likely to deploy their own nation’s units early in a joint crisis operation than units belonging to another nation. He termed this effect ‘national bias’ (Ekman, 2012). We designed an experiment similar to Ekman (2012). However, we framed our study in terms of organizations rather than nations and also added the investigation of the effect of changing one more
Organizational Adaptation in Multi-Stakeholder Crisis Response: An Experimental Study

independent variable. Despite the differences in context, we expect to see the same type of bias, i.e., the participants will prefer utilizing their own personnel and resources over the other organizations. The focus in the present study is not on whether decision makers in crisis management operations display organizational in-group bias but on whether the extent of bias can be influenced by variations in the two factors namely familiarity and ECFI (which are our independent variables in the study). We claim that this is important since the extent of organizational in-group bias displayed by crisis management professionals will influence the adaptive ability of organizations responding to crises. Thus, the more prepared the crisis management professionals are to work with or to utilize resources and personnel belonging to other organizations, the more easily a group of organizations can adapt to new organizational structures.

Several studies in different fields and contexts have indicated the relevance of prior knowledge or information and familiarity in organizational settings (see for example Grunfeld, Mannix, Williams, & Neale, 1996; Macy & Skvoretz, 1998; Bathe et al., 1999; McEntire, 2002; Kendra & Wachtendorf, 2003; Comfort, Dunn, Johnson, Skertich, & Zagorecki, 2004; Waugh & Streib, 2006; Comfort, 2007; Kapucu, 2008a, 2008b; Ansell et al., 2010). Studies focusing on social networks have also indicated that prior knowledge or information about other stakeholder organizations have positive effects on crisis cooperation (Uhr & Johansson, 2007; Uhr et al., 2008). These studies mapped communication and information flows in a crisis response network involving multiple stakeholders to reflect how different stakeholders act as an interdependent network in response to a crisis. Results show that such interdependent networks perform better with improved trust and familiarity (Jones & George, 1998; Uhr et al., 2007, 2008). However, it is not clear from previous research whether the increased performance is due to an increased ability of the organizations to adapt or due to some other mechanism.

In addition to familiarity, ECFI has been found to have a major influence on the outcome of negotiations in experiments conducted in the context of various sectors involved in the manufacture, design and marketing of a product (Ben-Yoav & Pruitt, 1984a, 1984b). It has been suggested that ECFI causes negotiators to move towards greater joint benefits and problem-solving attitudes, where the negotiators are willing to make trade-offs with their own goals in order to solve a joint problem (Ben-Yoav et al., 1984a). Familiarity between negotiators has also been observed to influence the overall negotiation process in a positive manner, as this enables negotiators to consider the concerns and goals of other negotiators, or in other words enable negotiators to have high concerns towards goals of others along with one’s own (Ben-Yoav et al., 1984a, 1984b; Macy et al., 1998; Misselhorn, 1978; Mitkidis, Sørensen, Nielbo, Andersen, & Lienard, 2013). From the crisis planning perspective, the propensity to make trade-offs between the goal of one’s own organization and the overall shared goal of a joint crisis response operation is likely to motivate problem-solving attitudes among stakeholders, leading to a more open attitude to the sharing of resources, personnel and information, or the utilization of resources across organizational borders, thus reducing in-group bias.

1.2. Theoretical framework

This study is concerned with the willingness to collaborate across organizational borders or group boundaries in crisis management. We frame this willingness in social identity theory (SIT), a perspective systematically introduced for the study of organizations by Ashforth et al. (1989). We believe this theoretical perspective is relevant in crisis management in today’s society. Modern crisis management is fragmented, complex, dynamic and increasingly characterized by interdependencies. In this context, the organizations typically involved in crisis management range from highly institutionalized bureaucracy to informal ad hoc constellations. We find that SIT is well suited to this context. SIT not only stresses the fluidity of the individual’s salient identity and associated biases, but also defines the organization in very broad terms. Furthermore, SIT also offers some suggestions for mitigating the negative effects evident in intergroup relations. Intergroup relations, as Hogg and Terry explain, can exist between organizations, units or divisions within organizations or even professions or socio-demographic categories that are distributed across organizations with different social identities (Hogg et al., 2000). Organizations may also serve as social groups and objects for identification. In SIT, a social group can also be a profession or socio-demographic categories that may be distributed within an organization or across organizations. Intergroup relations can thus exist both within organizations and across organizational borders (Hogg et al., 2000).

According to the SIT, people categorize themselves and others into various social groups (Tajfel & Turner, 1979). Such categorization provides the individual with a perceived set of beliefs, attitudes, feelings, behaviours and norms deemed appropriate for the group. This serves two purposes. It helps individuals to define themselves in the social environment, as well as helping to assess and predict the behaviour of others. This in turn reduces uncertainty (Ashforth et al., 1989; Hogg et al., 2000). Since, as humans, we tend to avoid uncertainty if we can (Curley, Yates, & Abrams, 1986), familiar
is preferred over the unfamiliar (Luhmann, 2000; Maslow, 1942, 1983), and familiarity through prior interactions breeds trust (Gulati, 1995; Jonker & Treur, 1999). In this way, people identify themselves into social in-groups and out-groups, or ‘us’ and ‘them’. This identification typically fosters in-group bias (Ashforth et al., 1989) and in collective settings people generally prefer to deal with in-groups rather than out-groups. In Marilyn Brewer’s words ‘Discrimination between ingroup and outgroup is a matter of relative favouritism toward the ingroup and the absence of equivalent favouritism toward outgroups’ (Brewer, 1999, p. 434). To summarize, the significance of social identity cannot be disregarded because of the norms, attitudes and values that influence group behaviour in organizational contexts (Cikara & van Bavel, 2014; Hogg & Reid, 2006; Smith & Louis, 2008; Smith et al., 2003; Terry et al., 2000).

Based on the above, we expect that participants will, in general, display in-group bias. Moreover, we also predict that stronger in-group bias will be demonstrated when intergroup familiarity is low than when it is high. We also predict that participants will demonstrate stronger in-group bias when they have no reason to expect future cooperation with out-group than when they do expect future cooperation. This is illustrated in Table 1.

We have formulated the following hypotheses concerning the behaviour of decision makers in a crisis management context that involves solving a task by two organizations.

1. If a decision maker’s familiarity with the other organization increases, the organizational in-group bias will decrease.
2. If a decision maker’s ECFI with the other organization increases, the organizational in-group bias will decrease.

Table 1. Predicted In-Group Bias under Different Conditions

<table>
<thead>
<tr>
<th>Factor</th>
<th>Familiarity with the other group</th>
<th>No familiarity with the other group</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECFI</td>
<td>Weak in-group bias</td>
<td>Moderate in-group bias</td>
</tr>
<tr>
<td>NO ECFI</td>
<td>Moderate in-group bias</td>
<td>Strong in-group bias</td>
</tr>
</tbody>
</table>

2. The experiment

2.1. Overview

The design of the current experiment was inspired by that used by Ekman (2012). As in Ekman’s study, we tested the independent variable familiarity, but in addition, we introduce a new variable, ECFI. The influence of these two independent variables on the degree of organizational in-group bias was tested. The participants in the experiment were given the task of making decisions in a joint crisis response operation. The decisions concerned prioritizing the deployment of units from two different organizations to a crisis area. The nature of the task was organizationally generic, meaning that it was not related to any specific organization (i.e., the police or the fire and rescue services). However, the participants were told that the Blue units were part of their own organization and the Red units were from the other organization. In total there were six Red units and six Blue units. Of the six units belonging to each organization, 2 were described as medical units, 2 were engineering units and 2 were security units. Organizational in-group bias was operationalized by investigating the order in which each participant deployed the units. If Blue and Red units were deployed in random order, no organizational in-group bias was exhibited. If Blue units were systematically deployed before Red units, that indicated organizational out-group bias. Similarly, if the Red units were systematically deployed before the Blue units, that indicated organizational out-group bias. The effects of familiarity and ECFI were investigated by changing whether the participants had knowledge about the other organization or not, and whether future cooperation with the other organization was expected or not.

Details of the instructions to the participants are presented in Appendix 1. The experiment was performed online or offline; the participants receiving identical instructions. The online participants were actively connected to the main author of the paper by phone or Skype, while they participated in the experiment, to ensure that the time limit was adhered to and that there was minimal external disturbance. Participants were sent links to the various scenarios once they were connected. The offline experiments were conducted in a classroom setting, and the responses of the participants were recorded on paper. The main author of the paper and an external observer were present during the offline experiment to ensure that there was no interaction between the participants, but only with the main author in relation to understanding the instructions to take the experiment. Particular attention was paid to the seating arrangement of the participants to minimize interaction. Thus, as described above, attention was paid to ensure online and offline settings of the experiment were as close as possible, if not identical. The reason behind conducting the experiment online or offline modes was to ensure availability of enough number of participants and the possibility to include participants from a variety of stakeholder organizations for the experiment. Because of logistic reasons, enough participants were available only when a choice of online or offline modes were given to them, whichever mode suited their calendar.
2.2. Participants

A total of 111 participants took part in the experiment. However, only 100 completed all the tasks, and only the results provided by these are included below. Out of 111, a total of 67 participants took the experiment offline and 44 of them took it online. The participants were field professionals from different organizations that are likely to be involved in joint operations in response to major crises: the police, the fire and rescue services, the Swedish Civil Contingencies Agency (MSB) and the Swedish Armed Forces.

High-ranking officers from the police and fire and rescue services from different regions in Sweden were approached, and asked to select suitable officers from their own region, with varied decision-making experience in crises that typically involved both the police and fire and rescue services. The personnel chosen from the MSB had been involved in international disaster response operations led by the EU or UN. This group included officers with different nationalities, apart from those from Sweden, who were employed by the MSB. Similarly, a mixed group of participants were chosen from the Swedish Armed Forces, with various levels of experience of decision making while representing the Swedish Armed Forces in international disaster response operations led by the EU or UN. A majority of the participants in our sample were Swedish. However, there were also several participants with other nationalities. For example, more than half of the participants from MSB were foreign nationals working for MSB in international crisis operations and approximately half of the participants from the fire and rescue services were also foreigners. 19 participants were recruited from the police, 34 from the fire and rescue services, 21 from the military and 36 from the MSB. The mean age was 38.8 years and they had been working in their current military and 36 from the MSB. The mean age was 38.8 years and they had been working in their current role for an average of 9.3 years with an average of 9.8 years as crisis responders.

Therefore, our sample is a good representation of professionals responding to crises on behalf of Swedish organizations.

2.3. Representativeness of the sample

The personnel selected from the organizations studied, were chosen so as to represent different hierarchical levels, with different degrees of experience as field professionals responding to domestic and international crises. All the participants were trained to respond in joint crisis operations. The police, for example, have extensive experience of working with the fire and rescue services and with the MSB, while the Swedish Armed Forces have extensive experience of working with the MSB and the police. Moreover, the participants were selected keeping in mind that they work in the organizations that often respond to both domestic and international crises, yet are distinct from each other in terms of their organizational values and day-to-day work, and the roles they play in a joint crisis response.

2.4. Procedure

We used a fully crossed, 2 familiarity (yes/no) × 2 ECFI (yes/no), with-in subject design leading to four different experimental conditions, denoted Scenarios A, B, C and D. Table 2 below summarizes the independent variables and words used to explain the variables in the four scenarios.

Each participant was exposed to all four scenarios, one at a time in a randomized order to minimize learning effects. During the entire experiment the participants were open to ask questions related to the understanding of instructions. During debriefing, the participants who took the experiment offline had the opportunity to comment on the experiment, which included the tasks given and the extent to which they felt the experiment reflected their real-life experience. Similarly, the individuals participating in the online mode of the experiment had the opportunity to comment on these issues during a brief interview of 15 minutes on completion of their online experiment. All participants were asked to motivate their decisions in the first scenario in free-text answers. Five of the 111 participants asked questions related to the understanding of the instructions, which indicates that the instructions to the participants were clear. All participants were given 30 minutes each to complete the experiment.

3. Results

3.1. Organizational in-group bias

The rank sum of Blue units ($r_{Blue}$) was calculated for each scenario. For example, if a participant chose to deploy all the Blue units first, the rank sum would be 21 ($1 + 2 + 3 + 4 + 5 + 6$). If, on the other hand, she or he chose to send all the Red units first, then the rank sum would be 57 ($7 + 8 + 9 + 10 + 11 + 12$). However, it is difficult to interpret these values based on their relation to the maximum and minimum values of $r_{Blue}$ in terms of the extent of organizational in-group bias. Therefore, we report the normalized rank sum, $r_{Blue, norm}$, as this is easier to interpret than $r_{Blue}$. Table 2. Scenarios Generated by the Two Independent Variables

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Familiarity</th>
<th>ECFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No$^1$</td>
<td>No$^4$</td>
</tr>
<tr>
<td>B</td>
<td>Yes$^1$</td>
<td>No</td>
</tr>
<tr>
<td>C</td>
<td>No</td>
<td>Yes$^1$</td>
</tr>
<tr>
<td>D</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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The normalized rank sum can assume a value between $-1$ and $+1$, where $+1$ means that the participant exhibits the maximum organizational in-group bias (by deploying all the Blue units first), and $-1$ means that the participant displays the minimum organizational in-group bias by deploying all the Red units first).

Figure 1 shows a box plot of the normalized rank sum for the four scenarios. The top and bottom of the boxes indicate the 25th and 75th percentiles of the normalized rank sums. The central line indicates the median value and the whiskers show the interval covering all values not considering outliers. The outliers (only two values) are indicated by red crosses. The median values of $r_{\text{Blue\_norm}}$ were .67, .39, .47 and .22 for scenarios A, B, C and D, respectively. The mean values of $r_{\text{Blue\_norm}}$ for the corresponding scenarios were .63, .38, .49 and .30. Thus, in accordance with SIT and results established from previous studies, most of the participants exhibited an organizational in-group bias in all scenarios, indicating organizational in-group bias is evident in a joint crisis response.

Several statistical tests were performed in order to investigate whether the results of our experiment were statistically significant. Anderson–Darling test (Anderson & Darling, 1952) was used to determine whether the distribution of $r_{\text{Blue\_norm}}$ was normal in all four experimental scenarios. This test showed that the distributions were not normal ($\alpha = .05$). Since the underlying assumption in parametric tests is that the data set is normally distributed, non-parametric methods were therefore used to investigate the effect of familiarity and ECFI.

A statistically significant difference ($\alpha = .05$) was found in the organizational in-group bias between the various scenarios using the Friedman test, $\chi^2(3, N = 100) = 68.01$, $p < .05$. Thus, one can exclude the possibility that there are no differences in terms of $r_{\text{Blue\_norm}}$ between the different scenarios. To investigate the differences in more detail we applied the Wilcoxon signed-rank test to determine whether there was a difference in the mean values of $r_{\text{Blue\_norm}}$ when doing a pairwise comparison of the scenarios. Since the test can only be performed on two scenarios at a time, six tests were performed to compare each of the scenarios with the others, applying a Bonferroni correction, resulting in an adjusted significance level of $p < .008$. The $p$-values obtained from the six tests are presented in Table 3. $A_{12}$ values representing effect size are also included.

Table 3 shows that there are statistically significant differences in terms of the mean rank sums for the blue units when comparing all scenario except for scenario B and C (it is the only $p$-value that is not below .008). Figure 2 provides an illustration of the results. The four boxes represent the different scenarios and the lines connecting the boxes illustrates whether there is a statistical significant difference in terms of the mean normalized rank sums ($r_{\text{Blue\_norm}}$). If there is no line between two boxes, there is no statistical significant
difference. In addition to investigating whether the mean value of the normalized rank sums are different for the different scenarios we also investigated the effect size by calculating the $A_{12}$ measure of stochastic superiority (Delaney & Vargha, 2002, p. 102). It was medium to high when comparing Scenario A to B ($A_{12} = .70$), A to C ($A_{12} = .67$), A to D ($A_{12} = .80$), B to D ($A_{12} = .64$) and C to D ($A_{12} = .89$). The interpretation of the $A_{12}$ values is straightforward; it is the probability that $r_{Blue, norm}$ is higher in the first experimental condition compared to the second for a randomly selected participant. For example, the probability that a randomly selected participant have a higher $r_{Blue, norm}$ value for scenario A compared with scenario B is 70%. In Figure 2, effect sizes are represented by the type of line; a continuous line represents a large effect size, a broken line represents a medium effect size.

The results thus show that changing a participant’s familiarity with the other organization’s units will influence the extent to which the participant displays organizational in-group bias. More precisely, if a participant is familiar with the other organization’s units it will decrease the organizational in-group bias compared with a situation where the participant is not familiar. Similarly, if a participant expects to have future cooperation with the other organization she displays a lower degree of organizational in-group bias compared with a situation where such future cooperation is not expected.

### 4. Discussion

We have investigated the effect on organizational in-group bias by varying the extent to which the participants are familiar with the resources, equipment and capabilities of another organization, and the extent to which they expect to be involved in future cooperation with that organization. We found that decision makers demonstrate lower organizational in-group bias when they are more familiar with the other organization, which is a strong support for hypothesis 1. The results also show that decision makers exhibit lower organizational in-group bias towards another organization when they expect future cooperation with that organization, which falls in line with hypothesis 2. The overall pattern of results described above was found to be consistent for all organizations. Referring back to the theoretical framework in the introduction section together with Table 1 which summarized our prediction of in-group bias under various conditions of ECFI and familiarity, as expected, the general trend of in-group bias was evident, which falls in line with SIT and with previous findings.

#### 4.1. Relevance and generalizability

In the experiment, we used hypothetical scenarios that aim to capture some of the essential characteristics of situations that crisis management professionals are likely to be exposed to in reality. Therefore the question whether our results are relevant to real crisis management needs to be addressed. Choosing an experimental setting rather than investigating real crises or simulating situations of real crises was a conscious choice. We argue that it would have been very difficult to investigate the effect of familiarity and ECFI on field. The primary reason is that both variables would be difficult to measure in real crises, and we would not have had the opportunity to control other external variables that might have interfered with the results (see for example Rosnow & Rosenthal, 2002). Moreover, the extent to which crisis management professionals in decision-making roles are prepared to use units from another organization would also have been problematic to assess in real crises. Further, it would have been difficult to collect the same amount of data as we were able to in our study (there were over 100 participants) and varying the independent variables in a systematic way would not have been possible.

Although we see the advantages of choosing an experimental setting for our study, in constructing hypothetical crisis scenarios, one loses much of the details of real crises that might be important (Turner, 1981). For example, even though the time allowed for the participants to answer the questions were limited in the experiment, it is difficult to simulate the time pressure of real crises. Moreover, the descriptions of the

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**Table 3.** The $p$- and $Z$-values obtained with the Wilcoxon Signed Rank Test for the Differences in Mean Normalized Values of the Rank Sums for the Blue Units ($r_{Blue, norm}$).

<table>
<thead>
<tr>
<th>Scenarios compared</th>
<th>$p$-value</th>
<th>$Z$-value</th>
<th>$A_{12}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>A and B</td>
<td>$2.03 \times 10^{-4}$</td>
<td>5.61</td>
<td>.70</td>
</tr>
<tr>
<td>A and C</td>
<td>$6.78 \times 10^{-2}$</td>
<td>4.97</td>
<td>.68</td>
</tr>
<tr>
<td>A and D</td>
<td>$7.28 \times 10^{-1}$</td>
<td>6.52</td>
<td>.80</td>
</tr>
<tr>
<td>B and C</td>
<td>$4.88 \times 10^{-2}$</td>
<td>$-1.97$</td>
<td>.48</td>
</tr>
<tr>
<td>B and D</td>
<td>$1.36 \times 10^{-3}$</td>
<td>3.20</td>
<td>.64</td>
</tr>
<tr>
<td>C and D</td>
<td>$1.61 \times 10^{-4}$</td>
<td>4.80</td>
<td>.89</td>
</tr>
</tbody>
</table>

**Figure 2.** The mean values of $r_{Blue, norm}$ for each scenario, where statistically significant differences are illustrated by the lines.
cisions in Hart, familiarity and ECFI in real crises (see for example the dis-


ment relevant and able to capture some important
discoveries and feedback from the pilot study and it was


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1

1

1

1

1


discipline behind your decision'. 63 out of the


participants in the main study, we found that 95 out of 100 (those who completed all parts of the experi-


factors while 32 said that Familiarity/ECFI was not


ment) explicitly mentioned Familiarity/ECFI in their response


participants. In addition, similar to posteriori assessment, where a


nurseries represent in our experiment are sufficient for


organized in groups, we did not employ


organization per se. Instead we used 'Team Blue' and


organizational in-group bias can be strongly influenced


As illustrated in the introduction section of the paper, organizational adaptation is an integral part of modern
crisis. Collaborative attitudes and openness to taking on new roles, structures and functions among crisis management personnel will facilitate such
adaptation (Hart, 2013; Lalonde, 2007; Rosenthal & Kouzmin, 1997). In our study, we have shown that
organizational in-group bias can be strongly influenced by varying the extent that crisis managers expect to
collaborate with other organizations in future (ECFI) and the familiarity of crisis managers with the
capabilities etc. of other organizations. By increasing ECFI, perhaps through long-term collaboration agree-
ments, and familiarity with other organizations, it is possible to increase the extent that the crisis manag-
ers are prepared to use personnel and resources from other organizations. This will most likely facilitate
organizational adaptation and could act as a counterweight to the desire to keep old organizational
structures, functions or roles in contexts where the management of crises could benefit from
change. Therefore, measures aimed at increasing both these factors will most likely lead to an increased
adaptive ability among crisis management organizations and ultimately to more efficient crisis manage-
ment operations.

4.3. Future research directions

Our study involves crisis management professionals in
decision-making roles from various Swedish organiza-
tions. The organizations are often involved in crisis man-
agement operations in Sweden, but they also participate in
international missions led by, for example, EU or UN.
For practical reasons, the study is limited to Swedish
organizations. However, it would be interesting to
design a similar study and conduct it in other countries
and investigate possible differences and similarities. Such
studies can help us understand how we can help to
improve collaborative behaviour among organizations
internationally and thus better prepare them to
respond to crises where international collaboration is
necessary. Furthermore, it would also be interesting to
investigate differences between people from different
types of organizations in more detail. Such a comparative analysis was out of scope for the present study, but we plan to conduct a more detailed analysis of the differences in a future paper. We also intend to investigate the reasons for the observed effects in more detail, e.g., why increasing familiarity appears to influence organizational in-group bias to a greater extent than increasing ECFI.

5. Conclusions

We have performed an experiment focusing on the context of multi-organizational crisis response with 111 participants from four different organizations to investigate the effects of changing familiarity and ECFI on organizational in-group bias. As expected, the organizational in-group bias was found to be strong. The results thus show that systematically favouring the use of specific types of units in crisis management is not limited to units of the same nationality, as shown in a previous experiment by Ekman (Ekman, 2009, 2012), but that it also extends to situations where crisis responders are more likely to favour their own organizations.

We investigated the effect of changing the familiarity of the participants with units from other organizations. The effect of increasing familiarity on organizational in-group bias was strong, causing the organizational in-group bias to be significantly reduced, although it did not disappear completely (hypothesis 1). We therefore conclude that in a situation where crisis management professionals are familiar with the units from other organizations, they are more prepared to work with or utilize them in a joint crisis response than if they are not familiar with them.

A similar, but not as strong, effect was also observed when changing the conditions with respect to ECFI, i.e., whether the participants expected to be involved in joint efforts with the other organization in the future (hypothesis 2). We thus conclude that in a situation where crisis management professionals expect to collaborate with the other organization in future, they are more prepared to work with or utilize the units from those organizations in a joint crisis response than if they do not expect such collaboration in future.

An increased willingness among crisis management professionals to work with or utilize personnel and resources from other organizations than their own will most likely lead to an increased adaptive ability of the organizations involved. Therefore, improving the knowledge of the resources and capabilities of crisis management organizations and establishing long-term cooperation agreements among them seem to be viable measures to increase the ability of organizations responding to crises to assume new structures and roles. Ultimately, this could facilitate collaboration across organizational borders and improve the overall management of crises.

Acknowledgements

The authors extend sincere gratitude towards the Swedish Armed Forces South region, Police headquarters South region (Sweden), Fire and Rescue Services (Räddningstjänsten, Sweden) and the Swedish Civil Contingencies Agency (MSB) for actively participating in the study and for making the study possible with their time and support. The authors also wish to thank the Division of Risk and Societal Safety, Faculty of Engineering, Lund University, Centre for Societal Resilience, Lund University, Swedish Armed Forces and MSB for funding part of the research on which the present paper is based.

Notes

1. In addition to the three rescue services that were formally under the command of the County administrative board, several persons, in addition to the commander, were recruited to the operation from other rescue services in Sweden.
2. Within-subject design is an experiment design in which every single participant is exposed to every single treatment including control. Each participant thus serves as her/his own control.
3. ‘…do not know about Red Team’s equipment, training or ability …’.
4. ‘…do not expect to be involved in joint efforts with Red Team in the future …’.
5. ‘…do know about Red Team’s equipment, training and ability …’.
6. ‘…do expect to be involved in joint efforts with Red Team in the future …’.
7. Outliers are values larger than $q_1 + 1.5 \times (q_3 - q_1)$ and smaller than $q_1 - 1.5 \times (q_3 - q_1)$, where $q_1$ is the 25th percentile and $q_3$ the 75th percentile.
8. Delaney et al. (2002, p. 106) suggest that a $A_{12}$-value of .56 corresponds to a small effect size, .64 to medium and .71 to large.
9. A priori assessment is a method applied to measure the degree to which a sample of items constitute an adequate operational definition of a construct. It is mainly aimed to develop the scale that is to be measured. For example, when we quantify a construct (e.g., extent of depression) and develop a scale to measure several items as constituents of that construct (e.g., indicators of depression). This is the first part of the two-phased measurement of content validity (Polit and Beck, 2006).
10. Posteriori assessment is carried out to measure the item relevance on the scale (e.g., to what extent are the indicators of depression measured in the particular test relevant). This constitutes the second part of the two-phased measurement of content validity (Polit and Beck, 2006).


Appendix 1
Introduction to exercise

Please keep in mind that this is not a test. There are no good or bad answers, solutions or comments. The aim of the exercise is to mirror reality, not textbook solutions. We are interested in your true professional decision making and for this reason we ask you to answer as you would have if this had been a real live situation. Thank you for considering this.

A team from your organization has been sent by your government as a part of a multi-organizational response to a sudden regional crisis with strong unrest and migration. Your organization is called Team Blue. There is another organization participating in the response that is called Team Red. No other details are known about the crisis. The response has not begun yet. The initial response consists of 12 response units. All units arrive in aircrafts. Six of the units belong to Team Blue. Six of them belong to Team Red. The units are of three types: security, medical and engineering. You are familiar with the units of Team Blue and you know that they are well trained and well equipped. All the 12 units are standing by on international airports outside the crisis area, waiting for your directives. Waiting is costly and both organizations have sent strong signals that they would want to move in as soon as possible. The crisis area airfield is in poor condition and can handle only one aircraft (unit) per day. The weather forecast shows that a sandstorm will reach the airfield on the second day. This sandstorm is likely to close the airfield for 6 days.

You do not know (do know) team Red’s equipment, training or ability to conduct the current type of task. You do not expect (do expect) to be involved in any joint efforts with Team Red in the future. Thus, the present task that you will perform together is probably a one-off event.
Your task

Decide the order of arrival at the airfield by marking which unit would you like to send on which day. Remember that you can assign only one unit per day. Since the sandstorm is expected to arrive on the second day and last until the seventh day you can only allocate units to time slot ‘Day 1’, and ‘Day 8’ to ‘Day 18’.

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Investigating effects of expectation of cooperative future interaction and familiarity on contribution in collaborative tasks in joint crisis response management: An experimental study

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1. Introduction

Modern day crises are transboundary in nature in the sense that the effects are not limited to geographical, economic, social or functional boundaries (Ödlund, 2010). In fact this “transboundary” nature makes it necessary for different stakeholder organizations to collaborate across boundaries in order to achieve their own goal, and at the same time they may have to create ties with each other for similar future interactions in crisis response (Ödlund, 2010; Ansell, Boin, & Keller, 2010; Hart, Heyse & Boin, 2001). Scholars like van Santen, Alberts and Hayes (2005) describe response to modern day crises as a network of actors that cooperate to achieve common goals.

However, recent studies on crises (for example van Santen, Alberts and Hayes, 2005; Ödlund, 2010; Comfort et al., 2014) indicate that there is lack of cooperation among different stakeholder organizations, information are most often not shared or optimally used, rules and regulation in crisis management procedures have also turned sub-optimal which make fulfilment of common goals for various actors a challenge. It is difficult for various organizations to attain common goals when a variety of stakeholder organizations or actors, their mandates, tasks, values and procedures come into play in modern crisis response (van Santen et al 2007; Alberts and Hayes 2005; Boin et al 2005, Helsloot 2008). Nevertheless, owing to the transboundary nature of modern crises, it is essential to facilitate collaborative behavior, attitudes of collaboration and cooperation not only across organizational borders but also across sectors among various stakeholder organizations.

As crisis cooperation is a type of interaction among stakeholder organizations to manage cross-sectoral activities (Ödlund, 2010), it may involve sharing of resources or information in order to achieve respective goals. Although these goals are independent in nature, their fulfilment depends on the interaction of stakeholder organizations across organizational borders. Willingness to contribute to joint crisis operations therefore becomes a factor that most likely affects collaboration across organizational borders. In fact in absence of
willingness to contribute in joint crisis operations perhaps there will be no collaboration across organizational borders.

In our study rather than looking at the willingness of stakeholders to contribute, we explore the extent of contribution or EOC, which is an actual measure of the behaviour of stakeholder organizations in crisis cooperation. We explore EOC in an experimental study where we measure number of response units that the decision makers from various stakeholder organizations actually send to joint crisis operations as contribution from their own organization. We aim to study different factors that motivate or influence decisions on EOC in context of crisis cooperation.

Previous research conducted by Av and Pruitt (1984), Hatch and Cunliffe (2006) in contexts of negotiation found expectation of future cooperation and on familiarity by Patton and Balakrishnan (2010), Ekman (2012) in contexts of collaborative tasks as two major factors among several others which affected decision making. Further, in one of our previous experiments, where we studied behaviour of decision makers from various stakeholder organizations in crisis cooperation, we also found expectation of future cooperation and familiarity lead to moderating the effects of decision makers systematically favouring their own organizations in terms of the order in which response units are deployed in a joint crisis operation, where the systematic favouring is called organizational ingroup bias (Pramanik, Ekman, Hassel and Tehler, 2015).

In the previous experiment we investigated factors that facilitate openness in behaviour of decision makers from various stakeholder organizations in terms of order of deploying units in a joint crisis operation, while in the present study we investigate collaborative behavior in terms of contribution by measuring number of units sent to a joint crisis operation. As crisis cooperation involves both aspects of being open to collaborate and contribute across organizational borders, therefore we can say that this study provides a natural complement to the previous one. Findings of the study offer us better understanding of collaborative behaviour in crisis cooperation, effects of motivating factors on collaborative attitude and collaborative behaviour. This knowledge has normative implications on facilitating crisis collaboration across organizational borders.
2. **Theoretical framework**

*Extent of contribution (EOC): rationale & background*

Decision making in negotiation is similar to crisis response because there may be different preferences for different stakeholders involved and therefore the stakeholder organizations involved try to settle for win-win situations to make the most of the collaborative interaction (van Santen et. al. 2007). The major characteristics that bring crisis response closer to negotiation process listed by van Santen are: (van Santen et al 2007).

a) The policy arena witnesses presence of multiple actors.

b) All actors have diverging interests which can also be at conflict.

c) No singular actor has overriding influence.

In addition, crisis response decision making cannot be restricted to standard operating procedures, which can prescribe quick fix solutions simply because crisis response decision making is subjected to variety of contexts or escalating situations that bear more resemblance to negotiation contexts where decisions are most often based on trade-offs. Our present study investigates EOC as an outcome of trade-off between collective goal and individual goal of decision makers from various stakeholder organizations which can be one of the most common potential situations of decision making to joint crisis response operations. Therefore it becomes reasonable to start looking at previous research conducted in negotiation contexts.

The studies carried out in negotiation contexts looked at willingness to cooperate rather than extent of contribution (EOC) as a measure of collaborative behavior. The findings indicated that when cooperation as an interaction is mutually beneficial, perceived more as a benefit than cost to those involved in cooperation, it steers a positive attitude or motivation towards higher willingness to cooperate (Mitkidis, Sorensen, Neilbo, Andersen and Lienard 2013). Not only so, the overall benefit of cooperation is more than aggregate contribution (Mitkidis, Sorensen, Neilbo, Andersen and Lienard 2013; West, Mouden and Gardener 2010; Bowles and Gintis 2003; Frank 2003, Ostrom 2000). Mitkidis et al. (2013) further argue that when cooperators perceive that the cooperation is beneficial in the long run, they might be willing to take some risks by delaying an immediate benefit for a greater future prospect (Mitkidis, Sorensen, Neilbo, Andersen and Lienard 2013).

Crisis cooperation involves several stakeholder organizations working towards a joint task of responding to a crisis, which otherwise no single stakeholder organization could have managed to respond to alone. Crisis responders are likely to be willing to contribute in a joint
task, as it involves a joint benefit of fulfilment of goals. They are likely to choose to cooperate with each other as long as it does not involve greater costs for each stakeholder organization than the overall joint benefit. Cooperation in crisis response context certainly denotes several collaborative activities across organizational borders which can include sharing resource, equipment or information. Therefore it is quite likely that one of the potential situations is that decision makers from various stakeholder organizations need to decide on a number on response units to be sent as a contribution from their respective organizations in a joint crisis operation.

We take our experiment a step further from previous research which studied collaborative attitude and behavior in negotiation contexts, while in our study we measure extent of contribution (EOC) which is a measure of collaborative behavior of crisis responders in contexts of joint crisis operations. We define extent of contribution (EOC) as the measure of actual contribution in terms of response units sent from one’s own organization to a joint crisis operation by decision makers from various stakeholder organizations. We also conceptualize EOC, as the outcome between two different kinds of goals of crisis responders during crisis cooperation. One of those is the common goal that various stakeholder organizations aim to achieve in a joint crisis operation, which is to respond to the crisis. At the same time, there exists an individual goal separate for each stakeholder organization to uphold its overall individual organizational interest. The outcome of EOC is in fact a relative balance between both of these goals namely the common goal and the individual goal. It is reasonable to believe that relative strength of these aforementioned goals shall also have an impact on EOC. The measure of EOC in our experiment is the number of response units that a crisis responder (in the role of decision maker in one’s own organization) actually chooses to send to the joint crisis response operation. We discuss the advantages of choosing such a design of the task in the experiment in methods section.

ECFI: background & rationale

Decision making in negotiations is driven by higher joint benefit (Yoav and Pruitt 1984). Higher joint benefit is of interest because agreements that yield higher joint benefit are more likely to persist and to contribute to the relationship between parties and of larger collectives of which they are part of (Yoav and Pruitt, 1984, p: 323). Following this, other negotiation experiments including those conducted by Yoav and Pruitt identified expectation to cooperative future interaction (ECFI) as a motivating factor to higher joint benefit.
Expectation to cooperative future interaction or ECFI is defined as the anticipation of working towards a common goal with the other party at a later time, where the goals involved can be both tangible and intangible (Av & Pruitt, 1984).

The findings of these experiments suggested that higher ECFI positively incline negotiators to exhibit higher problem solving attitudes. In other words, negotiators have a higher concern for their own goals, and they also exhibit higher concerns towards the goals of others. This means they are not only more resistant to settle for compromises which denotes nonfulfillment of own goals, but they are also concerned about higher outcome of goals of others, which results in a problem solving attitude and higher joint benefit (Av and Pruitt 1984; Av 1984; Hatch and Cunliffe 2006; Patton and Balakrishnan 2010). In addition, it was observed that higher ECFI resulted in better cooperation and also motivated participants to make positive long lasting impression on each other (Yoav & Pruitt, 1983).

Although previous research indicate relevance of ECFI in negotiation, it is to be noted that little empirical research has been conducted which studied effect of ECFI in collaborative behavior and decision making in crisis response prior to our study where we tested the effect of ECFI on organizational bias as a behaviour among decision makers from various stakeholder organizations in crisis cooperation (Pramanik, Ekman, Hassel and Tehler, 2015). ECFI becomes highly relevant in the context of modern crisis management because the interaction among various stakeholder organizations is similar to negotiation. Considering the complexity of modern day crises, which most often requires collaboration among different stakeholder organizations across organizational borders, investigating the effect of ECFI on collaborative behavior of stakeholder organizations becomes relevant and adds value to the knowledge of facilitating crisis cooperation among stakeholder organizations.

We therefore employ ECFI as one of the independent variables in our experimental study. One of the primary research questions in our study is to investigate the effect of ECFI on EOC.

Familiarity: rationale & background

Like ECFI, familiarity was also reported to be another factor which had a positive impact on negotiation (Yoav and Pruitt 1984). Familiarity can be described as the degree of interpersonal knowledge that individuals have regarding one another (Okhyusen 2001). It is defined by Rockett and Okyunsen as “a construct that individuals acquire and use information about others to guide their interactions in group settings” (Rockett and
Okhyunsen, 2001). According to Rockett and Okhyunsen, it is useful to understand familiarity as degree of interpersonal knowledge in order to establish relationships among individuals which affect the outcome of their interaction at individual as well as group levels (Rockett and Okhyunsen, 2001). They also argue that although familiarity is studied as a dyadic construct among two individuals in previous research, it is also a group level phenomenon that affects group interaction (Rockett and Okhysen 2001). This indicates relevance of familiarity not only in interaction among individuals but also interaction among different groups, where these groups can be organizations. Studies also suggest that number of prior interactions, amount of common knowledge shared and psychological variables like beliefs, training, degree of friendship or relatedness, are associated with familiarity and have been found to affect cooperative interaction and collaboration (Ledyard 1994; Ostrom 2000; Mitkidis et al 2013). Some studies also report that, when those involved in cooperation have high mutual trust and familiarity, cooperation is regarded as beneficial in long run (Mitkidis, Sorensen, Neilbo, Andersen and Lienard 2013; Ostrom 2005, 2000).

It becomes relevant to investigate effect of familiarity in crisis response because collaboration across organizational borders is a common feature in modern crisis response. Effects of familiarity on collaborative behavior of stakeholder organizations give us better knowledge to organize more efficient crisis collaboration.

As background or previous research on familiarity, some empirical studies which mapped information flows in crisis response, reported improved performance of those communication networks with improved trust and familiarity (see for example Jones & George, 1998; Uhr & Johansson, 2007; Uhr & Johansson, 2008). Further, Gulati (1997) reported familiarity breeds trust among organizations which is essential for long term ties. Ekman (2012) found that military and civilian individuals were more likely to deploy their own nation’s units early in a joint crisis operation than units belonging to another nation. This effect was termed “national bias” where the professionals showed greater favouritism to their parent nation because they were more familiar with their parent nation and this was investigated in a civil/military crisis management context.

Although from what we discussed above, we see here that previous research suggests familiarity to be an important factor in context of crisis response as well as in case of negotiation, however, little empirical research was carried prior to ours where we tested effect of familiarity on collaborative behaviour and decision making (see Pramanik, Ekman, Hassel and Tehler, 2015). While in the previous study we studied effect of familiarity on collaborative behaviour in terms of selecting order of deployment of response units in a joint
In the present experiment, we measure the effect of familiarity on collaborative behaviour by measuring the actual number of response units that decision makers from stakeholder organizations choose to send in joint crisis operations. We operationalize familiarity as the second independent variable in our present study. Thus, one of the primary research questions in our study is to investigate the effect of familiarity on EOC.

2. Method

Experiment design
We designed an experiment in which we tested the effects of independent variables ECFI and familiarity on the dependent variable EOC. The participants in the experiment were given the task of making decisions in a joint crisis response operation. The decisions concerned sending number of response units (from 1-10) belonging to one’s own organization to a joint crisis operation, keeping in mind the need to retain a certain number of response units which may be required as a contingency for an emergency that may occur simultaneously when the response units are already sent for the joint crisis operation. It was made clear that the response units already sent could not be brought back in case of emergency in one’s own area. The nature of the task was organizationally generic, meaning that it was not related to any specific organization (i.e. the police or the fire and rescue services). However, the participants were told that they belonged to Team Blue and the Blue units were part of their own organization, while Team Red with Red units belonged to the other organization. The participants were instructed that there were 10 Red units and 10 Blue units in total. Of which they could choose to send any number from 1 to 10 of Blue units to respond to the joint crisis. Although the participants had no information on how many number of Red units might be available for the joint crisis effort, nevertheless, they had information on the total requirement of number of response units at the crisis area which was 10. This meant that neither team Blue or Red could choose to send 0 response unit from their respective teams as it was a joint crisis effort. Details of the instructions to the participants are presented in Appendix.

EOC was operationalized by measuring the number of Blue units each participant decides to send (from 1 to 10) to the joint crisis operation, keeping in mind the need to retain a certain number of Blue units which may be required in case of a probable emergency occurring simultaneously. The interpretation of the numbers is straightforward. Higher the number of units sent, higher was the EOC. The effects of familiarity and ECFI were investigated by changing whether the participants had knowledge about the other organization (Red units) or
not, and whether future cooperation with the other organization (Red units) was expected or not, respectively.

The task given to the participants and the overall design of experiment has certain advantages:

a) Measurement of EOC: We have already seen earlier in the introduction section that crisis responders can contribute in a joint crisis operation by sharing resource, equipment or information across organizational borders. In our experiment we depict contribution in terms of resources which is number of response units. The measurement in this case becomes quite straightforward and easy because we are measuring tangible things like number of units compared to something intangible like equipment or information which cannot be quantified. Information or equipment is typically defined by their type or kind; thereby making measurement of equipment or information not possible in a straightforward manner.

b) Relative strength and balance between different goals: We already saw in the theory section how EOC is an outcome of the relative strength between collective goal and the individual goal of crisis responders. It is reasonable to expect that the participants who are in the role of decision making in their respective organizations find a balance between the collective goal of sending response units to the joint crisis operation while at the same time retain a certain number of units which may be required to encounter an emergency in their own area. Therefore the number of response units the participants choose to send is an indicator of their actual contribution to the joint cause or the collective goal. It is important to consider this relative strength between the two goals operationalized in the experiment as sending units and retaining units, in absence of which a participant (crisis responder) is likely to choose either extremes of answers, i.e. sending all response units belonging to one’s own organization or sending none.

c) EOC as the dependent variable: Combining the aforementioned characteristics in operationalization of the dependent variable, we investigate the impact of ECFI and familiarity on EOC which are the two independent variables in our study by using a combination of four experimental conditions and within subject design. We discuss the experimental conditions and within subject design in details in the coming subsection called procedure. Such a design enables us to measure the actual behaviour of crisis responders in terms of extent of contribution (EOC) in a joint crisis response which is mirrored in the task given to the participants in the experiment.
The word contribution denotes *individual accord to a joint cause*, which is exactly what we are interested in measuring in our study as behavior, hence the choice of term: extent of contribution (EOC).

**Experiment overview**

The experiment was performed online or offline where the participants received identical instructions. The online participants were actively connected to the main author of the paper by phone or Skype, while they participated in the experiment, to ensure that the time limit was adhered to and that there was minimal external disturbance. Participants were forwarded electronic links to the various experimental conditions or scenarios once they were connected to the main author by Skype or telephone. The offline experiments were conducted by the main author in a classroom setting, and the responses of the participants were recorded on paper. The main author of the paper and an external observer were present during the offline experiment to ensure that there was no interaction between the participants, but only with the main author in relation to understanding the instructions to take the experiment. Particular attention was paid to the seating arrangement of the participants to minimize interaction. Thus, as described above, attention was paid to ensure online and offline settings of the experiment were as close as possible, if not identical. The reason behind conducting the experiment online or offline modes was to ensure availability of enough number of participants and the possibility to include participants from a variety of stakeholder organizations for the experiment. Due to logistic reasons enough participants were available only when a choice of online or offline modes were given to them, whichever mode suited their calendar.

**Participants**

A total of 111 participants took part in the experiment. All 111 participants completed the task and results provided by them are included below. Out of 111, a total of 67 participants took the experiment offline and 44 of them took it online. The participants were field professionals from different organizations that are likely to be involved in joint operations in response to major crises: the police, the fire and rescue services, the Swedish Civil Contingencies Agency (MSB) and the Swedish Armed Forces.

High-ranking officers from the police and fire and rescue services from different regions in Sweden were approached, and asked to select suitable officers from their own region, with varied decision-making experience in crises that typically involved both the police and fire
and fire and rescue services. The personnel chosen from the MSB had been involved in international disaster response operations led by the EU or UN. This group included officers with different nationalities, apart from those from Sweden, who were employed by the MSB. Similarly, a mixed group of participants were chosen from the Swedish Armed Forces, with various levels of experience of decision making while representing the Swedish Armed Forces in international disaster response operations led by the EU or UN. 19 were recruited from the police, 34 from the fire and rescue services, 21 from the military and 37 from the MSB. The mean age was 38.8 years and they had been working in their current organization for an average of 9.3 years with an average experience of 10.8 years as crisis responders.

Inclusiveness and representativeness of the sample

The personnel selected from the organizations studied, were chosen so as to represent different hierarchical levels, with different degrees of experience as field professionals responding to domestic and international crises. All the participants were trained to respond in joint crisis operations. The police, for example, have extensive experience of working with the fire and rescue services and with the MSB, while the Swedish Armed Forces have extensive experience of working with the MSB and the police. Finally, the participants were selected keeping in mind that they work in the organizations most commonly identified as responders in both domestic and international crises, yet are distinct from each other in terms of their organizational values and day-to-day work, and the roles they play in a joint crisis response. Since the aim of the study was not to replicate a particular crisis, but to investigate the factors that might influence decision makers to be willing to contribute resources in joint crisis response efforts, the sample selected can thus be regarded as inclusive and representative.

Procedure

We used a fully crossed, 2 familiarity (yes/no) x 2 ECFI (yes/no), within subject design leading to four different experimental conditions, denoted Scenarios A, B, C and D. Table 1 below summarizes the independent variables and words used to explain the variables in the four scenarios.

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1 Within subject design is an experiment design in which every single participant is exposed to every single treatment including control. Each participant thus serves as her/his own control.
Table 1: Scenarios generated by the two independent variables

<table>
<thead>
<tr>
<th>SCENARIO</th>
<th>FAMILIARITY</th>
<th>ECFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No²</td>
<td>No³</td>
</tr>
<tr>
<td>B</td>
<td>Yes⁴</td>
<td>No</td>
</tr>
<tr>
<td>C</td>
<td>No</td>
<td>Yes⁵</td>
</tr>
<tr>
<td>D</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Each participant was exposed to all four experimental conditions or scenarios, one at a time in a randomized order to minimize learning effects. During the entire experiment the participants were open to ask questions related to the understanding of instructions. During debriefing, the participants who took the experiment offline, had the opportunity to comment on the experiment which included the tasks given and the extent to which they felt the experiment reflected their real-life experience. Similarly, the individuals participating in the online mode of the experiment had the opportunity to comment on these issues during a brief interview of 15 minutes on completion of their online experiment. All participants were asked to motivate their decisions in the first scenario in free-text answers. Seven of the 111 participants asked questions related to the understanding of the instructions, which indicates that the instructions to the participants were clear. All participants were given 30 minutes each to complete the experiment.

As another part of the experiment, we also posed two Likert scale questions to all 111 participants who took the experiment, on completion of the task in the experiment. The questions were generic in nature in context of crisis cooperation across organizational borders and did not limit to the experiment setting in specific. The motivation behind including the Likert scale questions was to capture the general understanding and perception among crisis responders of the two independent variables called ECFI and familiarity as constructs in crisis cooperation decision making. We made an appeal to the participants with similar written instructions that their response to these Likert scale questions should be based on collaboration in crisis management and joint crisis response efforts in general. The participants were instructed to indicate their level of agreement on a 7 point Likert scale, with

² “…do not know about Red Team’s equipment, training or ability…”
³ “…do not expect to be involved in joint efforts with Red Team in the future…”
⁴ “…do know about Red Team’s equipment, training and ability…”
⁵ “…do expect to be involved in joint efforts with Red Team in the future…”
7 indicating strongly agree, 1 indicating strongly disagree and 0 indicating cannot say. We indicate the Likert scale response as Likert 1 and Likert 2 referring to the constructs ECFI and familiarity respectively in rest of the text. The exact words of Likert scale questions posed to the participants are included in Appendix.

3. Results

Numbers of response units sent by each participant in each experimental condition or scenario are absolute values represented by n_A, n_B, n_C and n_D. These absolute values indicate EOC. We calculate the mean values for all 111 participants in each scenario and arrive at N_{meanA} N_{meanB} N_{meanC} and N_{meanD} to be able to measure EOC for each scenario. Figure 1 below represents the box plot for n_A, n_B, n_C and n_D.

Figure 1: Box plot for different scenarios.

The top and bottom of the boxes indicate the 25th and 75th percentiles of the number of units sent (N). The central line indicates the median value and the whiskers show the interval covering all values not considering outliers\(^6\). The outliers (only six values) are indicated by red crosses. The median value of N was 5 for all scenarios. The mean values represented by

\[^6\text{Outliers are values larger than } q_1 + 1.5\times(q_3-q_1) \text{ and smaller than } q_1 - 1.5\times(q_3-q_1), \text{ where } q_1 \text{ is the 25}\text{th percentile and } q_3 \text{ the 75}\text{th percentile.}\]
\( N_{\text{meanA}} \), \( N_{\text{meanB}} \), \( N_{\text{meanC}} \) and \( N_{\text{meanD}} \) for the corresponding scenarios were 5.64, 5.04, 5.83 and 5.25 respectively. We observe that the median values are identical for all scenarios and the \( N_{\text{mean}} \) are located close to each other, but the box plot also represents the overall spread of the \( N \) values which are direct indicators of EOC. It shows that the \( N \) values are spread in both directions, positive and negative, which indicates the effect of independent variables that may have caused the distribution. In order to investigate the difference between scenarios in details, we performed several other statistical tests to be able to find the effect of independent variables on EOC and how strong it is.

Anderson and Darling test (Anderson and Darling, 1952) was performed to test the normality of \( N \). The test showed a non-normal distribution (\( \alpha = 0.05 \)) and therefore, we chose to use non-parametric tests to analyse our results, as the underlying assumption of using parametric tests is that the distribution is normal.

Friedman Test was performed to detect whether there exists a statistically significant difference between various experimental conditions. We arrived at \( p \) value 0.003, < 0.05, and chi square approximation \( \chi^2(3, N=111) = 33.771 \), which indicate high statistical significant difference. This shows that we can disregard the possibility of having no difference between the experimental conditions.

We also performed the Wilcoxon signed rank test to compare the differences between experimental conditions in further detail. Since the test assumes pairwise comparison between two scenarios at a time, the four scenarios gave rise to six pairs. Table 2 below presents the \( p \) values, the signed ranks or \( W \) values from the Wilcoxon signed rank tests and the measures of \( A_{12} \) values from the paired tests. \( A_{12} \) values are measures of stochastic superiority which is used to report the effect size (Delaney and Vargha 2002, p. 102). The values indicate the probability of a randomly selected participant in the first experimental condition with a greater \( N_{\tau} \) value than the second. For example in scenario AB, \( A_{12} \) value 0.64 can be interpreted as, the probability of a randomly selected participant in Scenario A to have a higher \( N_{\tau} \) value than a randomly selected participant in Scenario B is 64%.
Table 2: p values, W values and $A_{12}$ values between different pairs of scenarios

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>p- value</th>
<th>W- value</th>
<th>$A_{12}$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A – B</td>
<td>0.0002</td>
<td>1516</td>
<td>0.6486</td>
</tr>
<tr>
<td>A – C</td>
<td>0.1950</td>
<td>422.5</td>
<td>0.4909</td>
</tr>
<tr>
<td>A – D</td>
<td>0.0574</td>
<td>1523</td>
<td>0.6126</td>
</tr>
<tr>
<td>B – C</td>
<td>0.0031</td>
<td>430.5</td>
<td>0.3333</td>
</tr>
<tr>
<td>B – D</td>
<td>0.2798</td>
<td>383.5</td>
<td>0.4774</td>
</tr>
<tr>
<td>C – D</td>
<td>0.0003</td>
<td>1686.5</td>
<td>0.8018</td>
</tr>
</tbody>
</table>

The table shows that we find high statistical significant difference by comparing the p values, $<0.05$, between scenarios AB, BC and CD. Scenario AD shows a statistical significance close to 0.05. Similarly while comparing effect size between scenarios, we find a high effect size, $>= 0.71$ for scenario CD and medium effect size which is $>= 0.64$ for scenario AB. Scenario AD exhibits a value close to the medium effect size. This shows that we find a stronger effect of familiarity (F) on EOC as we change the variable from low (no) to high (yes), while we do not find such an effect of ECFI on EOC, when a similar change occurs for ECFI in various scenarios.

Figure 2 below represents the change in scenarios in terms of the independent variables, familiarity and ECFI with respect to the mean values of the number of units sent by all participants in various scenarios (Nmean). Nmean values for each scenario are given in the boxes. Presence of lines between scenarios indicates statistically significant difference between scenarios. The continuous lines represent the high effect size between the scenarios while the dash dotted lines represent a medium effect size. No line represents low effect size ($>= 0.56$) and no statistical significant difference.

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7 Delaney and Vargha (2002, p. 106) suggest that a $A_{12}$-value of $0.56$ corresponds to a small effect size, $0.64$ to medium and $0.71$ to high.
Figure 2: $N_{\text{mean}}$ and the effect size between different scenarios.

The figure indicates the following:

a) When familiarity changes from no to yes, we see a decrease in the $N_{\text{mean}}$ as we move from A ($N_{\text{meanA}}$ 5.64) to B ($N_{\text{meanB}}$ 5.04). Similarly, there is a decrease as we move from C ($N_{\text{meanC}}$ 5.83) to D ($N_{\text{meanD}}$ 5.25). This suggests that higher the familiarity, lower the number of units sent ($N$). Since $N$ represents measure of EOC, we can say that, higher the familiarity, lower the EOC.

The figure also shows that the difference between scenarios A to B and C to D is statistically significant when familiarity changes from no to yes. We notice a high effect size in C to D and a medium effect size in A to B. This clearly indicates that higher impact of familiarity on EOC than ECFI.

b) When ECFI changes from no to yes, in scenario A to C and B to D, we find an increase in the number of units sent. We find higher values for $N_{\text{meanC}}$ 5.83 compared to $N_{\text{meanA}}$ 5.64 and $N_{\text{meanD}}$ 5.25 compared to $N_{\text{meanB}}$ 5.04. However, this difference between A to C or B to D, when ECFI changes from no to yes, is not statistically significant, which is indicated by absence of lines between scenarios. Nevertheless, we note the general tendency that higher the ECFI, higher are the number of units sent ($N$), in other words, higher the ECFI, higher the EOC.

Although the values represented by $n_A$, $n_B$, $n_C$, $n_D$ and $N_{\text{meanA}}$, $N_{\text{meanB}}$, $N_{\text{meanC}}$, $N_{\text{meanD}}$ indicate EOC, it is more relevant and interesting for practical purposes to look at the difference between the numbers of units sent in various experimental conditions or scenarios instead of choosing the absolute values for comparison. This is because, the difference enables us to compare various scenarios and have a better understanding of impact of familiarity and ECFI on EOC. This allows us not only to measure EOC but also to find the effect on EOC, meaning
whether EOC increases or decreases with change in familiarity and ECFI. It can also provide an indication towards the mechanism behind the choice (EOC) a participant has made in a given scenario. We denote the difference in terms of number of units sent by $\delta$.

Further we must remember that $\delta$ can be either positive or negative. The positive or negative signs indicate the effect of independent variables. For example, if lower numbers of units are sent in the second condition compared to the first when comparing two scenarios, $\delta$ shall remain positive and vice versa. Therefore we can say that further away these $\delta$ values on either sides of 0, positive or negative, larger is the effect of the changed condition or effect of the independent variables. Table 3 below represents the $\delta$ between different scenarios.

<table>
<thead>
<tr>
<th></th>
<th>AB</th>
<th>CD</th>
<th>AC</th>
<th>BD</th>
<th></th>
<th>AB</th>
<th>CD</th>
<th>AC</th>
<th>BD</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>48</td>
<td>44</td>
<td>65</td>
<td>68</td>
<td>43.24</td>
<td>39.64</td>
<td>58.56</td>
<td>61.26</td>
<td></td>
</tr>
<tr>
<td>&lt;0</td>
<td>48</td>
<td>46</td>
<td>22</td>
<td>19</td>
<td>43.24</td>
<td>41.44</td>
<td>19.82</td>
<td>17.12</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>111</td>
<td>111</td>
<td>111</td>
<td>111</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: $\delta$ between different scenarios and percentage.

As Likert scale questions were included as a part of our experiment, figures 4 and 5 below represent the distribution of Likert scale response. It can be seen that both figures have similar distributions with a very high percentage of participants choosing Likert points 5, 6 and 7, with a maximum percentage at Likert point 6, indicating higher level of agreement. The figures indicate that the participants believe ECFI and familiarity to be motivating factors that makes them willing to contribute to a joint crisis response across organizational borders. This means, although EOC, has a higher effect of familiarity than ECFI, nevertheless, both ECFI and familiarity are perceived to be equally significant as two essential motivating factors to contribute to a joint crisis response across organizational borders by crisis responders.
4. Discussion

*The effect of familiarity on EOC and number of response units sent:*

Our findings indicate that there is a strong effect of familiarity on EOC. Since previous research, as we discussed in details in the theoretical framework section of the paper also claim that familiarity is a motivating factor which influences contexts of negotiation, we see that our finding is in line with previous research. We also see that familiarity as a motivating factor not only influences higher negotiation outcomes but also influences EOC in crisis cooperation.
cooperation across organizational borders in a positive manner. However the aspect of decreasing number of response units being sent when a participant is more familiar with another organization is quite interesting and needs a special discussion.

Trust is defined as “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to control or monitor the other party” (Mayer, Davis and Schoorman, 1995, p. 712). Consequently the scholars further argue that risk taking or the willingness to become vulnerable is an outcome of trust which is different from willingness to take risks. This means, as an outcome of trust, it is sufficient to be willing to become vulnerable and on the other hand to be willing to take risks per se, is in fact going a step further and not a necessary outcome of trust (Schoorman, Mayer and Davis 1996, 2007). Trust has also been described as a pragmatic strategy to reduce uncertainty (Meyerson, Weick and Kramer 1996, p. 192). Since as humans we tend to avoid uncertainty if we can (Curley, Yates and Abrams, 1986), we prefer familiar over unfamiliar (Maslow, 1942, 1983; Luhmann, 2000). Further, it is also well established that familiarity breeds trust (Gulati, 1995).

From the above discussion we notice how trust and familiarity are closely linked and how a familiar one is chosen over unfamiliar to be trustworthy in order to avoid uncertainty to an extent possible. This provides an explanation to the decision of the participants to send less number of units when they are familiar with the other organization. Familiarity with the other organization meant prior knowledge about their capability, equipment and resources which established trust on them. Therefore by sending less number of units to the joint crisis response, the participants are decreasing uncertainty for both crises simultaneously. By placing trust on the capability of the other organization to be able to contribute at least equally in terms of number of response units for the joint response operation, if not more, the participants are decreasing the uncertainty involved in the collective goal. Similarly, trust on the other organization enables the participants to retain the minimum number of response units that may be required to counter the contingency situation by their own organization, which is their individual goal. Thus, it is reasonable to find a relative balance between number of units sent towards the collective goal and those retained towards the individual goal. It must be noted that in absence of trust, participants choose to send more units to the joint crisis operation, which shall fulfil the collective goal but puts the individual goal at stake, or in other words, creates an uncertainty towards fulfilment of the individual goal.
The effect of ECFI on EOC and number of response units sent:

The definition and description of ECFI concurs that it is an anticipation of working with another party towards a common goal at a later time for a benefit tangible or intangible. It is to be noted that the variable is therefore limited to an expectation at a later period. Further, it provides no additional clues on what to expect in terms of good or bad, which creates an uncertainty. Following the concept of uncertainty, we know that risk perception literature establishes that due to the human tendency of avoiding uncertainty to the extent possible. Also as humans, we are better in planning for a short period.

So if we link these concepts to effect of ECFI on EOC, we find that it is difficult for the participants to be willing to be vulnerable or uncertain based on an anticipation or expectation that is yet to be experienced.

On the other hand, trust and familiarity provide stronger grounds or bases to make such decisions directly related to risk. Aspects of trust and familiarity which are associated with reputation, organization, role, rule, prior knowledge or even prior interaction establish trust and familiarity and therefore provide much better grounds to rely on the other organization. Therefore the participants are willing to be vulnerable. Thus from the above discussion we find an explanation why we do not find a significant effect of ECFI on EOC, as we do in case of familiarity.

EOC and Likert scale response:

The results exhibit that although both ECFI and familiarity are perceived to be equally significant in motivating crisis responders to be willing to contribute in collaboration across organizational borders however, while measuring EOC, we find only familiarity has an effect on EOC. This is because extent of contribution or EOC is the actual behavior while willingness to contribute across organizational borders is an attitude. It seems in this case where we look at EOC in terms of sending response units does not exactly have a causal relationship with the attitude although there exists a relationship. We performed Spearman analyses which did not show a perfect correlation between EOC and the Likert scale response. In other words, contribution in joint crisis response can be in several forms for example sharing equipment, information etc. and sending response units is one of them. In absence of the attitude or willingness to contribute in a joint crisis operation, of course there shall be no contribution or collaboration across organizational borders at all. Therefore we see that while
EOC in terms of sending number of units as a measure of behavior has a stronger impact of familiarity than ECFI, both ECFI and familiarity bear equal significance and have normative implications in terms of facilitating collaboration and contribution across organizational borders among crisis responders.

In fact in one of our previous study where we looked at the effect of ECFI and familiarity on organizational group bias, we found both higher ECFI and familiarity to have moderated organizational ingroup bias (Pramanik, Ekman, Hassel and Tehler, 2015). This further illustrates that component of risk bears a stronger influence on decision making. In the present study, the participants connected familiarity with getting rid of uncertainty in order to achieve both collective and individual goals and therefore find familiarity to be more effective in EOC. This can be connected back to the earlier discussion on perception of risk and its close links with trust and familiarity. Although the design of the task was an outcome of the relative strength of the two goals, namely collective and individual, in both experiments, the previous experiment did not have any obvious risk component, unlike the present one. Therefore we found significant effects of both ECFI and familiarity in the previous experiment. Similarly, in the present study, the Likert scale response was directed towards general perception of ECFI and familiarity as motivating factors that facilitate collaborative attitude, and we find a high percentage of agreement from the crisis responders.
References:


