The Use of Resilience Strategies in Crowd Management at a Music Festival

- and the safety organization’s role in avoiding crowd conflict

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Abstract

Each year people are injured and even die in crowd related accidents, often during planned events. Recent studies have emphasized the need for using a systems approach to study these events. In this study the systems approach of resilience theory is combined with the crowd psychology-models Extended Social Identity Model and the Aggravation and Mitigation Model to examine event safety at a music festival, a domain previously largely unexplored by these perspectives. By using an ethnographic approach as well as interviewing visitors the study set out to answer questions about when and how the safety organization adjusted itself under conditions relating to crowds. Another goal was to study the social identity of the visitors as well as the interaction between the safety organization and the visitors at the festival to explain the presence or absence of crowd conflict. Using thematic analysis several situations were identified where the safety organization adjusted itself, as well as the strategies that the organization used in these different circumstances. It was also concluded that the absence of crowd conflict could best be explained by three factors. First of all, no history of crowd conflict existed between the safety organization and the visitors, secondly, there were no groups present with the goal of creating conflict, and thirdly, the social processes taking place between the safety organization and the visitors were all mitigating in nature. The mitigating nature of the social processes was partly attributable to the strategies identified for adjusting to crowd conditions.
# Contents

1 Background ........................................ 1
   1.1 Purpose ........................................ 2
   1.2 Domain-description ........................... 2
      1.2.1 Event Safety ............................ 2
      1.2.2 The Festival ............................. 5
      1.2.3 Glossary ................................ 7
   1.3 Complex Systems Theory ....................... 8
      1.3.1 Cognitive Systems Engineering .......... 8
      1.3.2 Resilience Engineering ................ 10
   1.4 Crowd Psychology ............................. 16
      1.4.1 Deindividuation ......................... 17
      1.4.2 Social Identity Theory ................. 17
      1.4.3 Elaborated Social Identity Model ....... 18
      1.4.4 Aggravation and Mitigation Model ..... 19
   1.5 Research questions ........................... 20
   1.6 Delimitations ................................. 20

2 Method .......................................... 21
   2.1 The researcher’s role and bias ............... 21
   2.2 Data collection ............................... 22
      2.2.1 Participatory observations ............... 23
      2.2.2 Visitor interviews ...................... 24
      2.2.3 Structured observations ................ 25
   2.3 Analysis ...................................... 25
      2.3.1 Qualitative Analysis Theory ............. 25
      2.3.2 Preparing the data .................... 26
      2.3.3 Analysing the data .................... 26

3 Results .......................................... 28
   3.1 Crowd Management and Resilience .......... 28
      3.1.1 The role and work of crowd managers .... 28
      3.1.2 Crowd management routines .............. 29
      3.1.3 Crowd pen density ....................... 35
      3.1.4 Entrances ................................ 37
      3.1.5 Adjusting to crowds .................... 38
      3.1.6 Resilience strategies .................. 39
   3.2 Social Identity and Crowd Conflict .......... 44
      3.2.1 Festival visitors and their identity ..... 44
      3.2.2 Categorizing, Organizing and Mutual Treatment 46
   3.3 Linking it all together ...................... 51
4 Discussion

4.1 Resilience and Resilience Strategies .......................... 54
4.2 Social Identity and Aggravation and Mitigation .................. 56
4.3 Crowd Management, Crowd Control and Crowd Conflict ............ 57
4.4 Method discussion ............................................. 59
    4.4.1 Analysis .................................................. 61
4.5 Future research ............................................... 62

5 Conclusions ...................................................... 63

6 References ....................................................... 66

List of Tables

1 Earlier event accidents ........................................... 5
2 Glossary .......................................................... 7
3 Resilience Strategies Framework-example (adapted from Rankin, Lundberg, and Woltjer (2011) with permission) ....................... 15
4 Collected Data .................................................... 22
5 Time of interview ............................................... 24
6 A generalized version of a crowd management routine ............ 30
7 Description in short-column ....................................... 45
8 Impressions of volunteers and staff ............................... 47
9 Impressions of deputized security .................................. 47

List of Figures

1 A framework for analysing resilience strategies (reprinted from Rankin et al. (2011) with permission) ................................. 15
2 A timeline for the different stages of the study. .................... 21
3 An overview of the event taking place Tuesday evening on Stage 7 31
4 Stage 8 Crowd Management Routine .................................. 34
5 Examples of crowd pens .......................................... 35
6 Resilience Strategy: Crowd management routines .................... 39
7 Resilience Strategy: High crowd density in cue ..................... 40
8 Resilience Strategy: Crowd pen density ............................ 41
9 Resilience Strategy: Crowd pen opening and closing ............... 41
10 Resilience Strategy: Crowd pen balancing ........................ 41
11 Resilience Strategy: Entrances .................................... 42
12 Resilience Strategy: Monitoring for efficient resource allocation 43
13 Resilience Strategy: Adjusting routines ........................... 43
B1 The visual aid used in for one of the interview-questions ........ 70
1 Background

Not a year goes by without crowd related deaths and injuries and most of us can name at least a few tragic examples\(^2\). One example that still stands out in many minds is the tragic events that took place during the Love Parade in Duisburg, Germany, in 2010, where 21 people lost their lives and more then 510 people were injured in a overcrowded tunnel. In a recent analysis by Helbing and Mukerji (2012) the cause of the accident is attributed to a complex interplay of causal interdependencies between different factors, that is, it was a complex systemic failure where crowd management eventually failed. Crowd management is the effort to avoid these accidents by managing and guiding large crowds in safe ways. It is a complex task that grows in complexity the larger the crowd being managed is.

In a report commissioned by Great Britain’s Cabinet Office called *Understanding Crowd Behaviours: Guidance and Lessons Identified* (2010) existing research on crowd behaviour was reviewed with the purpose of identifying gaps in said research and identify ways forward for the field of crowd management. In-depth reviews of 550 academic papers, books and official reports were carried out and was supported by 27 semi-structured interviews with a wide range of experts including academics, experienced police officers and key crowd event and management practitioners. Among other things the report pointed out the importance of adopting a systems-wide approach to crowd management, a field where many researchers have suggested there exists a culture of focusing on technology and technical solutions, rather than considering the wider, more social aspects. The report also identified a gap in the existing literature in that no research at all had been concerned with stewards working at events. While research on how the interaction between the police and the crowd affected crowd behaviour was plentiful, there was no equivalent investigation of stewards. In the connected report *Understanding Crowd Behaviours: Supporting Theory and Evidence* (2010) the following is pointed out:

> Given that stewards are often the initial point of contact for crowd members, and that their behaviours towards, and interactions with, a crowd is highly likely to influence how the crowd behaves, it is essential that research be carried out in this area. - *Understanding Crowd Behaviours: Supporting Theory and Evidence* (2010, p. 241)

During the literature review made for this thesis the author has also noted another fact about the existing literature. While examples of research into crowd behaviour, movement, modelling, statistics and the like are plentiful, the actual work of managing crowds and the organizations that are responsible for this work has not been researched to the same extent.

Combining such diverse theoretical approaches as complex systems theory in the form of resilience (which describes how an organization adjusts in order to handle expected and unexpected events), and crowd psychology, this study sets out to bridge this gap in the current literature by studying the work of crowd management at a large music festival, as well as the interaction between the visitors and the safety personnel\(^3\) at said festival.

\(^2\)See Table 1 on 5 for a few examples of previous accidents.

\(^3\)Steward is a term usually associated with a type of personnel in the UK which have undergone training to work at events. Since this study took place in Sweden safety personnel or safety volunteer will be the preferred terms to avoid confusion about the terminology. For a complete glossary, please refer to Table 2 on page 7.
1.1 Purpose

The purpose of this study is twofold. For one it tries to determine if resilience theory is an useful approach for understanding the work of managing crowds at a large music festival in Sweden. For the other it tries to evaluate the usability of contemporary theories of crowd psychology in describing the visitors and the interaction between visitors and the safety organization at said music festival. It could be said that the study tries to use two quite different approaches to study how the safety organization works with large masses of its visitors and how the visitors in their turn identify themselves and categorize other visitors and the safety organization. This can also lead to valuable lessons about the interaction between these two areas of study. The hope is to explore the feasibility of expanding these theories to a previously largely unexplored domain, as well as exploring the domain from another perspective than is common in contemporary research.

1.2 Domain-description

In this section of the thesis the domain under study will be presented. It will start off by presenting event safety as a concept and then explore some previous accidents at music festivals to give insight into why it is an important area of study. The focus will then be narrowed to the specific festival where the study took place, then to the safety organization at this festival and then to crowd management as related to this specific organization. The section will end with a glossary explaining domain-specific words and abbreviations that are commonly used in the thesis. When not stated otherwise the information in this section is based on prior knowledge, observations made during the study, the British Event Safety Guide (1999) released by the British Health and Safety Executive and the Swedish Event Safety Guide (2012) released by the Swedish Civil Contingencies Agency. In the event safety industry the British Event Safety Guide is commonly referred to as the 'Purple Guide' because of its cover and this is the name used in the thesis to separate the British and the Swedish Event Safety Guides.

1.2.1 Event Safety. In this thesis, events are in their basic form defined to be any type of gathering in the form of a planned public or social occasion. It can be a concert, a sporting event, a religious event, a convention, a party, a festival or many other types of gatherings. They can be really small and only attract a couple of friends from the neighbourhood, or really large and attract thousands or even millions of people internationally. In this study the focus is event safety at a music festival and so this is the type of event safety that will be described further.

Event safety is the task of managing the health, safety and welfare of visitors, staff and contractors at events (Purple Guide, 1999, p. 7). It is almost always the case that the event organizer is also legally responsible for the safety at the event and when it comes to larger events the safety planning is part of the planning for the event itself. The Swedish Event Safety Guide notes that:

This is achieved by the promoter identifying potential risks and how these ought to be managed. This risk analysis then provides a basis for devising systems in

\[^4\] It should be noted however that there are many similarities between music festival safety and other types of event safety, especially concert safety (which is a part of music festival safety) and sporting events.
RESILIENCE STRATEGIES IN CROWD MANAGEMENT

the form of a safety organisation, rules, policies, plans and practices. Finally, resources are supplied in terms of staff and equipment.

The following keywords should typify safety planning and safety measures:

- Anticipation
- Readiness to act
- Fail-safe mechanisms

The objective here is to achieve predictability, thereby increasing the probability of a safe event. -Event Safety Guide (2012, p. 13)

The Purple Guide (1999, p. 7) lists the key elements of successful health and safety management as including:

- Creating a health and safety policy
- Planning to ensure the policy is put into practice
- Organising an effective management structure and arrangements for delivery of the policy
- Monitoring health and safety performance
- Auditing and reviewing performance

Both guides emphasise the importance of planning and also that the planning for safety at an event should start at the same time as other planning. Because safety is tightly linked to the realisation of an event, the safety organization is a part of the event organization and works closely with other organizations within the event. It is important however that it is a separate organization so that it does not have conflicting responsibilities.

As research in other domains have shown safety is not an unambiguous concept and its definition is not without its troubles. This will be discussed further in Section 1.3 but in relation to event safety the difference between safety and security should be addressed. Safety deals with the protection from unintentional harm, while security deals with protection from intentional acts. Protection from accidents is contained within the first notion while protection from violence or criminal acts is contained within the second. Planning for safety often includes planning for security as well but this is not always the case and the exact approach to these issues varies largely between different events and organizations. Sometimes the same organization handles both safety and security and sometimes they are separated into separate organizations.

A music festival is a complex and dynamic event where unexpected things happen all the time. The gathering of thousands of different individuals, who often consume alcohol, together with temporary structures, heavy machinery and technical equipment in what is often an outdoor-space is an unpredictable environment to say the least. Coupled with strong focal points in the form of entrances and stages it makes for an environment where incidents and accidents of varying severity can and do happen. It is therefore important

Interestingly enough the Swedish language does not offer separate words for these two notions, instead their meanings are both contained within the word "Säkerhet".
that the safety organization is structured in such a way that it can deal with events that are unexpected in nature as well as those that are planned for.

Crowd safety is a discipline in itself that is one part of event safety. Much of the research on crowd safety comes from research on pedestrian and evacuation behaviour, ranging from statistical modelling to behavioural research (e.g. Fang, Song, Zhang, & Wu, 2010; Hughes, 2003; Moussaïd et al., 2009; Seyfried et al., 2009). Since this study is more concerned with the actual work of managing crowds as it happens, this literature will not be reviewed in detail.

1.2.1.1 Personnel. At music festivals in Sweden most of the personnel working with safety are volunteers. In exchange for working they often get food and admission to the festival when they are not working. The key personnel involved usually works throughout the whole festival either as volunteers or as salaried personnel depending on the event. Large music festivals often have hundreds of volunteers involved in safety work at any given time and it would almost always be impossible to make monetary ends meet if they were all salaried. Because of this much of the personnel does not have prior experience of safety work and in safety planning it is important to take this into account and plan for proper education of the personnel.

Since deputized security guards are commonly mentioned in the thesis a clarification is in order. In Sweden security is often handled by deputized security guards having passed a special education given by the police. Upon passing this education limited law enforcement capacities are granted the deputized security guard and while not completely accurate they are often described as being "police officers limited to their explicit area of operations". They do not have investigative powers and may only arrest a person if they saw the crime being committed, but they also have the legal power to dismiss, remove or if needed apprehend people disturbing the peace. They wear a uniform that share similarities with the police and have the right to use force if needed to perform their duties. Their most common place of work are nightclubs and while they are hired by the event organizer they answer to the police authorities, who also decides upon the minimum number of deputized security guards an event must hire.

1.2.1.2 Earlier accidents. Accidents at events are sadly not uncommon. In Table 1 a selection of accidents with deadly outcomes at mainly music and sporting events can be seen. Accidents at nightclubs and religious events are not included in the list since they are somewhat different in nature, but it should be noted that deaths related to religious events are many. The pilgrimage to Mecca, Hajj, and in specific the Stoning of the Devil-ritual has claimed many thousands of lives over the years, the most notable event taking place in 1990 when 1426 pilgrims died because of overcrowding in a tunnel. The Hajj has indeed been the subject of much research on crowd safety (e.g. Helbing, Johansson, & Al-Abideen, 2007; Johansson, Helbing, Al-abideen, & Al-bosta, 2008). The most common cause of death in crowd related accidents is compressive asphyxiation, that is, the force of the crowd becomes so high that individuals in the crowd can no expand their torso to

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6 Deputized security guard is the translation chosen of the Swedish word 'Ordningsvakt'. Another category of personnel often involved in security work is called 'Väktare', best translated as simply security guard, and while they too are licensed personnel their education is not held by the police, they are not deputized and they have the authorities of a regular citizen. Their most common task is that of surveillance and they are not commonly employed during the opening hours of a festival.
breathe. When the crowd density is high enough this can happen when people are standing upright, but it can also happen from the resulting force when people fall to the ground, end up on top of each other and can not get up from the ground.

The many tragic accidents listed in Table 1 together with all the accidents not listed should hopefully be explanation enough why research into the area of event and crowd safety is important.

Table 1

<table>
<thead>
<tr>
<th>Earlier event accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where</td>
</tr>
<tr>
<td>The Who-concert</td>
</tr>
<tr>
<td>Heysel Stadium</td>
</tr>
<tr>
<td>Kathmandu Stadium</td>
</tr>
<tr>
<td>Hillsborough Stadium</td>
</tr>
<tr>
<td>Mateo Flores Stadium</td>
</tr>
<tr>
<td>Troitsa Festival</td>
</tr>
<tr>
<td>Hultsfred Festival</td>
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<tr>
<td>Roskilde Festival</td>
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<tr>
<td>Lantern Festival</td>
</tr>
<tr>
<td>The Love Parade</td>
</tr>
<tr>
<td>Khmer Water Festival</td>
</tr>
<tr>
<td>New Year’s celebration</td>
</tr>
</tbody>
</table>

1.2.2 The Festival. The festival in this study was a large music festival in Sweden. This particular summer the festival lasted 5 days and had a little over 48 000 visitors, with more then 30 000 living at the temporary festival camp-sites within walking distance of the festival area. A slightly humorous, yet true, saying among the safety personnel was that the camp-sites had about the same population as Monaco. The festival started out small 13 years earlier, gradually growing, and had always taken place in and around the city center of a small town. There were two distinct areas of the festival joined together, one adjacent to the city center and one in a larger adjoining park. Popular international and national artists were the main attractions and including the less known artists there were many hundreds of performances spread over the 9 stages. The music genres were diverse and the festival was not geared towards a specific target audience. Somewhere around 6000 volunteers in total worked before, during and after the festival.

1.2.2.1 The Safety Organization. The safety organization at the festival consisted of about 2500 personnel and volunteers working throughout the festival days. There were also about 120 deputized security guards and 200 licensed first aid-personnel working in their respective sub-organizations. The head of safety had two deputies and together they were responsible for the planning, realisation and implementation of safety at the festival. There were over a 100 key-personnel involved at different levels of the organization that consisted of 17 operative groups as well as a backroom staff. The backroom staff included a chief of staff, VIP safety coordinators, a fire safety coordinator, crowd managers, a quartermaster, crew coordinators, liaison coordinators, a safety coordinator and stage safety coordinators. The role of the backroom staff was to support the head of safety as well as the operative part of the organization in decision-making and with administrative
tasks. The leaders of the operative groups were called safety managers and they had at
least one deputy. The groups were; troubleshooters, festival area safety, perimeter safety,
outer areas safety, entrance safety, festivalpass exchange, night security, camp site safety
as well as one safety group for each of the 9 stages. The key personnel was salaried and
in most cases highly experienced, most had worked at the festival previously. There were
three types of personnel in the operative safety-groups, regular volunteers, full volunteers
and salaried personnel. The regular volunteers worked in total about 30 hours during the
week in exchange for a festival pass. The full volunteers worked full-time during the festival
and the salaried personnel were experienced personnel hired for specific positions where
experience was important, such as at the largest stages.

The organization was hierarchical in nature and the chain of command was strict.
The safety personnel answered to the safety managers who answered directly to the head of
safety who in turn answered directly to the festival CEO. The safety organization had a close
cooperation and daily meetings with the local police, ambulance and fire departments. The
safety coordinator also coordinated work with the social welfare office, youth organizations,
temperance societies and many other collaborative partners present at the festival in an
effort to promote the visitors’ peace of mind.

Some of the later analysis in this thesis requires a clear definition of the system
of analysis. Henceforth, when ‘The Safety Organization’ is referred to in the thesis this
encompasses the parts of the safety organization described above, but not the deputized
security guards or the licensed first aid personnel. The deputized security guards are referred
to as such and the licensed first aid personnel were not included in the study at all. Neither
does ‘The Safety Organization’ include police, ambulance or fire services or any of the
collaborative partners. It does however include both the backroom staff and the operative
part of the safety organization. Since a distinction between the blunt end of the organization
and the sharp end will be used and since this is a relative rather than an absolute distinction
it should be defined for the system of analysis. In this study the Safety Managers working
out among the visitors were considered to be the sharp end of the organization, while
documented routines as well as the backroom staff were considered to be the blunt end.

1.2.2.2 Crowd Management. There are several definitions of crowd manage-
ment and it is often contrasted with crowd control. In the report Understanding Crowd
Behaviours: Guidance and Lessons Identified (2010, p. 13) crowd management is defined
as ‘the facilitation of crowd activities’ which is operationally distinct from crowd control,
which is defined as ‘the actions taken to control the crowd once behaviours become undesir-
able’. The safety organization offered definitions for these two concepts at a presentation
held for the safety managers. Crowd management was defined as: ‘By means of soft values
and constructions guide the behaviour of crowds’ and crowd control was defined as: ‘By
mainly physical means controlling a crowd’. Another way to put this is that when crowd
control is used, the question asked is ‘How can we (by force) move this crowd to where we
want it?’ while the question asked when crowd management is employed would rather be
“How can we make this crowd want to go where we want it to go (i.e. where it is safe)?”.

These definitions however only deals with the active intervention of trying to affect
a crowd in some way. Crowd management at the festival also dealt with trying to predict
crowds, plan for crowd movement and the monitoring of crowds so that measures could be
taken early if risks arose. The safety organization had a crowd manager and two deputy
crowd managers that were part of the backroom staff. Their primary function was to predict and monitor crowd movement and to support decision making related to crowds. They had no personnel of their own and their work did not include actively managing crowds themselves, but rather to provide guidance for other safety managers in doing so. The head crowd manager was also deeply involved in the planning of the festival.

Since the work of crowd management at the festival is another system of analysis that requires a clear definition, one will be offered here. ‘Crowd Management’ refers to the task of managing crowds at the festival, regardless of who is performing that task. Crowd management involves many parts of the safety organization, often including deputized security guards as well, but the natural focus of the study is the work performed by the crowd managers themselves.

1.2.3 Glossary. A glossary explaining some of the commonly used words in this thesis, as well as any abbreviations, can be seen in Table 2.

Table 2
Glossary

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bike rack</td>
<td>A 2 meter long, 1,2 meter high fence used to guide people or for soft enclosures. Is not designed to handle crowd pressure.</td>
</tr>
<tr>
<td>Cordon tape</td>
<td>Tape used to indicate closed off areas or as guidance.</td>
</tr>
<tr>
<td>Crowd Control</td>
<td>By mainly physical means controlling a crowd.</td>
</tr>
<tr>
<td>Crowd density</td>
<td>Refers to the density of the crowd. In Sweden usually measured by the number of people per m$^2$.</td>
</tr>
<tr>
<td>Crowd Management</td>
<td>By means of soft values and constructions guide the behaviour of crowds.</td>
</tr>
<tr>
<td>Crowd Management Routine (CMR)</td>
<td>A predetermined way to manage various phenomena around crowd flow and gatherings of people.</td>
</tr>
<tr>
<td>Crowd Manager (CM)</td>
<td>A role at the festival for predicting, monitoring and supporting decision making about crowds.</td>
</tr>
<tr>
<td>Crowd pen</td>
<td>An enclosure meant for a crowd. Can refer to part of an area in front of a stage, or to the fenced off-part of a cue.</td>
</tr>
<tr>
<td>Deputized security guard</td>
<td>A security guard deputized by the Swedish police. Has limited law enforcement capacities.</td>
</tr>
<tr>
<td>Front of House (FoH)</td>
<td>An area located in the audience area in front of the stage where sound and lightning operators perform their work.</td>
</tr>
<tr>
<td>Front of stage barrier</td>
<td>A crowd barrier meant to withstand crowd pressure. Usually placed in front of a stage, sometimes in multiple layers, creating crowd pens.</td>
</tr>
<tr>
<td>Safety Manager (SM)</td>
<td>Group leader responsible for an operative safety-group.</td>
</tr>
<tr>
<td>Safety Personnel</td>
<td>Any personnel working with safety.</td>
</tr>
<tr>
<td>Safety Volunteer</td>
<td>A volunteer working with safety.</td>
</tr>
<tr>
<td>Stage pit</td>
<td>The area in front of a stage that is sealed off from the audience area by front of stage barriers. Where safety personnel works.</td>
</tr>
<tr>
<td>Stage right/left</td>
<td>Used to denominate the right and left parts of the stage as seen when standing on the stage looking out towards the audience.</td>
</tr>
</tbody>
</table>
1.3 Complex Systems Theory

A classic definition of a safe system is when the number of adverse effects (such as, but not limited to, incidents and accidents) can be kept acceptably low. Because of this traditional definition of safety, models tend to describe what goes wrong and why (Hollnagel, 2006). This description tends to attribute failure to a system component rather than the system as a whole (Leveson, 2004) and is related to the fact that traditional event-based accident models tend to explain accidents in terms of multiple events sequenced as a chain over time. The last event in a chain is often described as a root cause but because this stopping point is selected arbitrarily (the event chain can almost always be propagated further) the assignment of the root cause is pragmatic. When the reason for conducting the accident investigation is to assign blame for the accident this pragmatism leads to the stopping point often being decided on when someone or something appropriate to blame has been found (Leveson, 2004). Because human performance is seen as unreliable, the root cause often leads to defences or barriers being implemented to avoid the same failure in the future, or that because the system is presumed to be faultless the humans are trained to better fit the designed system (Furniss, Back, Blandford, Hildebrandt, & Broberg, 2011).

1.3.1 Cognitive Systems Engineering. Cognitive Systems Engineering (CSE) was first formulated 30 years ago and had three main driving forces (Hollnagel & Woods, 2005). The first driving force was the growing complexity of socio-technical systems due to the fast growth of technology. The second driving force was the problems and failures created by a clumsy use of these technologies. The third driving force was the limitations of linear models and the information processing paradigm. These linear models almost exclusively consisted of some form of model of input-processing-output and this had many consequences for the emerging human-machine view. Interaction between humans and machines came to be described as mediated through input and output leading to a disintegrated view of the two. Hollnagel and Woods (2005) notes that this disintegrated view reflects the assumptions of the information processing paradigm in two ways; predominant models for cognition are sequential or procedural prototype models and actions are seen as responses to events, mediated by internal processes and structures. They further note that this view has several consequences:

- Actions are treated as a series of discrete events rather than as a continued flow of events.
- Users are seen as single individuals.
- The proactive nature of actions is neglected and the focus is on response rather than on anticipation.
- The influence of context is indirect and mediated by input.
- Models are structural rather than functional.

In actuality they mean that actions should be treated as a continued flow of events, users rarely work alone, human action is more often than not based on anticipation rather than simple responses, context has a decisive influence and models should be functional rather than structural. A cognitive system is thought of as a new unit of analysis, focusing on the system as a whole, and is defined as "a system that can modify its behaviour on the
basis of experience so as to achieve specific anti-entropic ends” (Hollnagel & Woods, 2005, p. 22). A cognitive system’s ability to cope with complexity is a central issue for CSE:

The basic issue for CSE is how to maintain control of a process or an environment. Both processes and environments are dynamic and therefore complex, and joint cognitive systems are striving to cope with this complexity. The coping takes place at both the individual and the organisational levels, the latter as in the design of work environments, of social structures, and of technological artefacts. -Hollnagel and Woods (2005, p. 71)

In this view accidents are seen as representing the outcome of complex interactions and coincidences in the system rather than specific failures of components or functions. These coincidences are most often due to normal performance variability in the system. That is, both failure and success in the system are due to the fact that performance is variable in all the components of the system, from mechanical components to organisations. To avoid accidents control is needed over the performance variability and a requisite for that is the monitoring thereof. Monitoring performance variability can be used both for suppressing negative outcomes and enhancing positive ones (Hollnagel, 2004). The Law of Requisite Variety states that the variety of the outcomes (of a system) can be decreased only by increasing the variety in the controller of that system. The purpose of the regulator or controller is to keep the variety of the system’s output within certain limits and this can only be achieved if the variety of the regulator or controller is at least equal to that of the system (Hollnagel & Woods, 2005).

Hollnagel and Woods (2005) makes a distinction between four levels of control that a system can have:

- **Strategical** control is when a system has a long time horizon and can look ahead at higher-level goals. Planning and the choices of action are not as dependent on the current situation but instead focus on long-term goals.
- **Tactical** control is when a system more or less follows a known procedure or rule. Planning is of limited scope or range, but goes beyond the dominant needs of the present.
- **Opportunistic** control is when the salient features of the current situation determine the next action and planning as well as anticipation is limited.
- **Scrambled** control is when the choice of the next action is basically random and little reflection or thinking is involved. It is characterized by trial-and-error.

Moreover, four generic conditions can be said to affect the loss of control in a system:

- **Lack of time** includes both lack of time for making accurate predictions about the future, as well as the lack of time to act. The operator needs time to take in new information, to decide what to do, to update the current understanding of the situation and of course to act.
- **Lack of knowledge** comes both from not being able to recognize and identify what is going on, and from not being able to place this into a context.
• **Lack of readiness or preparedness** is the lack of not knowing what to do. Not being prepared for a situation might mean that selecting an appropriate action is difficult and takes time. This does not have to be attributed to the people in the system, but might stem from the fact that the system has gone beyond its design limits.

• **Lack of resources** includes all the resources that are not time- or knowledge-based. This includes everything from personnel to equipment.

Loss of control is often precipitated by unexpected events and Westrum (2006) describes three aspects to threats that a system can face. The first aspect is the predictability of the threat, the second aspect is the threat’s potential to disrupt the system and the third aspect is whether the origin of the threat is internal or external to the system. If the origin is internal it is often handled by internal checks, safeguards or quality controls that would repair the error or pathogen and keep them from spreading. If the origin is external it requires a response on the systems part. Westrum (2006) also notes that while protection from threats are usually covered under the rubric of "defences" this word does not distinguish between the two origins. These three aspects are the basis of a classification of situations, namely the regular threat, the irregular threat and the unexampled event. A regular threat is one that occur often enough for the system to develop a standard response that can be applied. An irregular threat is a one-off event for which it is hard to prepare a standard response. It is a low-probability event that can have devastating consequences and provides an understood, but still challenging problem. An unexampled event in contrast is something that pushes a system beyond the collective experience of its components. It is an event that is near enough impossible to anticipate and to prepare a response for.

**1.3.2 Resilience Engineering.** Resilience Engineering is an emerging discipline, and research methods and perspectives continues to be developed (Furniss et al., 2011). It has been compared to a paradigm-shift in the Kuhnian sense in that it tries to take a major step forward from more traditional views by proposing a completely new way of thinking about safety (Woods, 2006b). In an attempt to contrast Resilience Engineering to earlier approaches Furniss et al. writes:

Avoiding, detecting and recovering from failure is different from traditional approaches to safety which look at risk analysis and prevention, and traditional approaches to human factors that largely focus on improving task and system design. Instead, resilience focuses on action to compensate for poor behaviour, poor design, poor systems and poor circumstances. -Furniss et al. (2011, p. 3)

There has been several attempts at defining resilience, such as Westrum’s (2006) three major meanings of resilience:

- Resilience is the ability to prevent something bad from happening,
- Or the ability to prevent something bad from getting worse,
- Or the ability to recover from something bad once it has happened.

Another definition comes from Woods (2006a), saying that resilience is "how well a system can handle disruptions and variations that fall outside of the base mechanisms/model for being adaptive as defined in that system". A slightly different definition is offered by (Lengnick-Hall & Beck, 2009):
We define resilience capacity as the organizational ability and confidence to act decisively and effectively in response to conditions that are uncertain, surprising, and sufficiently disruptive that they have the potential to jeopardize long-term survival. -Lengnick-Hall and Beck (2009, p. 41)

The definition of resilience used in this thesis is offered by Hollnagel (2011). While the other definitions puts an emphasis on some combination of the systems ability to prevent, respond to and recover from disruptions, this definition instead focus on a systems ability to adjust its own functioning:

Resilience is defined as the intrinsic ability of a system to adjust its functioning prior to, during, or following changes and disturbances, so that it can sustain required operations under both expected and unexpected conditions. -Hollnagel (2011, p. 275)

Hollnagel further notes that resilience refers to a quality, something a system does, rather then a quantity, something a system has. It is a capability or process rather then a property. Resilience Engineering is concerned not only with what makes systems resilient and how to make them resilient, but also with how to maintain or manage the resilience of a system. While traditional definitions and models of safety has tended to focus on what goes wrong and why, Resilience Engineering argues that it is necessary to focus on what can go right as well. A proposed definition of safety is thus "the ability to succeed under varying conditions", moving the emphasis away from failure (Hollnagel, 2011).

The definition has a few implications and first of all it is important to clarify that changes and disturbances in all these definitions are seen as a part of the normal system variability, it does not have to be an incident or accident. In Resilience Engineering the emphasis is not on maintaining the system unchanged in the face of disruptions. While protecting and sustaining its primary functions is important, this can be achieved by more traditional means, such as defence-in-depth and barriers. Instead the definition, and Resilience Engineering, puts emphasis on the ability to adjust rather then just to continue functioning under expected and unexpected conditions. This adjustment can take place prior to, during or following changes and disturbances. In order to adjust the system needs indicators of its state. These indicators can be lagging, current or leading, that is, they can indicate the past, the present or a future state of the system. Indicators comes with a multitude of issues to consider, such as their reliability and validity, objective or subjective interpretation, whether they are sufficiently sensitive to change, whether they can be used for making concrete actions and whether they are easy and cheap to use or difficult and costly (Hollnagel, 2011).

1.3.2.1 The Four Cornerstones of Resilience. Because resilience is defined as being able to adjust prior to, during or following changes and disturbances Resilience Engineering is concerned with anticipating, monitoring, responding to and learning from them. These are put forth by Hollnagel (2009) as "The Four Cornerstones of Resilience" and were further elaborated by Hollnagel (2011). Unless stated otherwise, the descriptions of the cornerstones below is from Hollnagel (2009).
Anticipating - Knowing what to expect.

In looking for the potential, the goal is to identify possible future events, conditions, or state changes - internal or external to the system - that should be prevented or avoided. -Hollnagel (2009, p. 126)

Because regular threats are often already quite known to the system and mostly require monitoring for, anticipating rather deals with identifying the most likely irregular threats, it deals with what is potential. Traditional risk assessment does look for the potential, but is constrained because it relies on representations and methods that focus on linear combinations of discrete events, such as event and fault trees. While this might be acceptable for tractable systems which are well-defined, the more intractable a system is the more traditional risk assessment-methods fall short. What is then needed is individual and collective imagination to explore possible future risks. This is costly because it takes time and also deals with something that may happen so long into the future that benefits are rather uncertain.

Monitoring - Knowing what to look for.

A resilient system must be able to flexibly monitor what is going on, including its own performance. The ability to monitor enables the system to cope with that which could become critical in the near term. -Hollnagel (2009, p. 124)

While anticipating deals with a more long term time horizon, monitoring deals with a shorter one. The idea of flexible monitoring entails re-assessing the basis for monitoring every now and then so that it does not become constrained by routine and habits. Monitoring what is going on is often based on looking for certain conditions or indicators that things might become critical, and use this information to put the system from normal operations into a state of alertness and readiness to respond. This is more cost-effective then keeping the system in a constant state of readiness. Both the ability to monitor and the ability to respond depend on being able to imagine the threat or event, whether it is possible to prepare a response and whether it is cost-effective to do so. Because of this, these two abilities mainly deal with regular threats, while irregular threats and unexampled events must be dealt with in a different manner. Not knowing whether an event or threat is imminent severely limits the systems ability to adjust its functioning prior to the event, making monitoring an important ability for resilient systems.

Responding - Knowing what to do.

In order to respond when something happens the system must be able to detect that something has happened. Second, it must be able to identify the event and recognize or rate it as being so serious that a response is necessary. Third, the system must know how to respond and be capable of responding; in particular it must have or be able to command the required resources long enough for the response to have an effect. -Hollnagel (2009, p. 121)

Responding deals with the actual, the here and now. Some types of responding include mitigating the effects of an event, preventing deterioration or spreading of effects, to restore the state that existed before the event or to resume the functioning that existed before.
While these can all be good types of responses, they are not what defines a resilient system. What defines a resilient system is instead the ability to adjust its functioning to better match the new conditions. It further needs to do so both timely and effectively so that they can bring about the desired outcome before it is too late (Hollnagel, 2011). Deciding whether an event is so serious that a response must be made can refer either to establishing a level of readiness or to taking action in the concrete situation. When it comes to establishing a level of readiness and which response capabilities are necessary, one must first consider what risks to protect against and what risks are acceptable. One principle that might be of use is the As Low As Reasonably Practicable or the ALARP-principle, defined in Hollnagel (2009) as "A risk is ALARP if the cost of any reduction in that risk is grossly disproportionate to the benefit obtained from the reduction". When it comes to taking action in the concrete situation this can be done either by technology or by humans. In the case of technology this is done according to predetermined rules or algorithms and in the case of humans it is heavily reliant on the competence of the specific individuals involved. Being able to respond also relies heavily on having the resources to do so available. Having prepared resources always available is only cost-effective for some regular threats, so a resilient system also needs to be flexible enough to make necessary resources available when needed, especially when it comes to irregular threats or unexampled events. In responding to events it is also essential to be able to distinguish between what is urgent and what is important (Hollnagel, 2011).

**Learning - Knowing what has happened.**

The effectiveness of learning depends on what the basis for the learning is, i.e., which events or experiences are taken into account; on how the events are analyzed and understood; and on when and how often the learning takes place. -Hollnagel (2009, p. 127)

Learning deals with the factual and a resilient system is characterized by how it approaches learning in a few cases. First of all, a resilient system tries to learn from how it functions and not only from its failures. Since resilience is the ability to sustain normal functioning and not only to prevent failures, it should not limit learning to only incidents and accidents. Secondly, a resilient system does not only describe events on the basis of their causes, as in the classic approach. Instead it looks for dependencies among functions and for the typical or representative variability of functions. Thirdly, learning should be continuous rather then discrete and should not be driven by events, but instead by a plan or strategy. This is closely connected to the first idea that a resilient system should learn from how it functions in normal circumstances. If learning is done from everyday functioning, it is much easier to learn continuously.

**1.3.2.2 Resilience Strategies.** In a review of selected resilience case studies Furniss et al. (2011) points out that not all studies have a clear link between their observations and higher level resilience theory. They also conclude that studies are directed at different levels of granularity (individual/organizational), that there is no agreed criterion or approach for analysis and the analyses fail to build on each others’ work. The studies reviewed operate at three different levels of abstraction, high-level principles, mid-level strategies and low level examples. Papers that operate solely at the high-level principles level risk being to abstract and hard to associate with the specifics of practice, while papers
that operate at the lower concrete observations level risk being to descriptive, specific to a particular context and hard to generalise. A traceable framework will better link theory to evidence as well as better enabling researchers to build on each other’s work. Furniss et al. (2011) proposes such a framework in the form of Resilience Markers, Resilience Strategies and Observations of Resilience. Resilience Markers are few and can be generalised across domains, Resilience Strategies expand on the detail of the markers but are still not grounded in the specifics of a particular context and Observations of Resilience are the output behaviour and what actually happens in practice. Resilience Strategies are further expanded into four elements, Resilient Repertoire, Mode of Operation, Resources and Enabling Conditions and Vulnerabilities and Opportunities.

In a study involving 9 focus groups with 32 practitioners from 8 different safety-critical domains Rankin et al. (2011) combines the four cornerstones of resilience (Hollnagel, 2009) and the elements of Resilience Strategies (Furniss et al., 2011) to analyse strategies for managing everyday working situations of 'working close to the safety margin'. Some of the Resilience Strategies-categories were taken out and others revised to better fit the data and based on the analysis a framework for describing Resilience Strategies in everyday work was proposed. The framework can be seen in Figure 1.

A Strategy can be improvised or recurring and is a function of Forces and Conditions that may lead to an Unwanted Outcome that the strategy is meant to prevent or mitigate. To do this, certain Resources and Enabling Conditions are needed. The strategy entails actions of the type Monitoring, Responding, Anticipating and Learning and are performed by Sharp-end/Blunt-end Interactions. Conditions are the circumstances that cause the system to perform close to or past the safety margin and they are caused by Forces that can be internal or external to the system (cf. Westrums (2006) third aspect of threats a system can face). Sharp-end/Blunt-end Interactions is a distinction that strategies can be local adaptations (sharp-end), part of instruction or procedure (blunt-end) or both. One example of an analysis using this framework is presented in Table 3. The example is from the railway domain and is adapted from Rankin et al. (2011).
Figure 1. A framework for analysing resilience strategies (reprinted from Rankin et al. (2011) with permission)

<table>
<thead>
<tr>
<th>Resilience Cornerstones</th>
<th>Forces (F) external (ex), internal (in) and Conditions (C)</th>
<th>Unwanted Outcome</th>
<th>Strategy</th>
<th>Resources &amp; Enabling Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responding, Monitoring</td>
<td>Train doors are not locked if there is a step and handle on the outside (C) due to EU regulation (F, ex). Late passenger tries to get on train (C). Train aims to leave on schedule (C) due to system dependencies and economic gain (F, in).</td>
<td>Passenger gets hurt attempting to get on a train in motion.</td>
<td>Slow down, push and pull people on and off train (sharp end). Close doors 30 sec before departure (blunt end).</td>
<td>Detection of dangerous act, staff availability, ability to drive slowly.</td>
</tr>
</tbody>
</table>
1.4 Crowd Psychology

With his "The Crowd: A Study of the Popular Mind" (1896) Gustave Le Bon is often considered the father of crowd psychology. The first debate on the subject actually took place a few years prior between a couple of criminologists concerning how to determine criminal responsibility in the crowd (Sighele, Tarde as cited in Reicher, 2004) and this reflects the view of crowds in the late 19th century France quite well. The violent victory of mass action against the state in the form of the Paris Commune was fresh in mind and the republic after the commune was weak and saw the rise of syndicalism, anarchism and socialism. Crowd study was motivated by fear and its main goal was not to understand, but to repress the crowd (Reicher, 2004). In his work Le Bon (1896, p. 2) develops the "Law of the mental unity of crowds" which is based upon the idea that crowds in the psychological sense are more than just gatherings of individuals. Under certain given circumstances a gathering of individuals presents new characteristics which are very different from those of the individuals composing it. The ideas and sentiments of the people in the gathering take the same direction and their conscious personality vanishes. A collective mind is formed and the gathering can be considered an organized, or psychological, crowd subjected to the "Law of the mental unity of crowds". Le Bon notes:

Whoever be the individuals that compose it, however like or unlike be their mode of life, their occupations, their character, or their intelligence, the fact that they have been transformed into a crowd puts them in possession of a sort of collective mind which makes them feel, think, and act in a manner quite different from that in which each individual of them would feel, think, and act were he in a state of isolation. -Le Bon (1896, p. 6)

According to Le Bon this collective mind does not consist of a sum or average of the individuals own characteristics, but these rather combine to create the completely new characteristics that the crowd possesses. Different causes determine the appearance of these characteristics peculiar to crowds. The first is that the individual feels empowered by the pure numbers of the crowd. Because a crowd is anonymous, and in consequence irresponsible, the sentiment of responsibility in the individual disappears. The second is a phenomenon where every sentiment and act in a crowd is contagious to the degree that an individual readily sacrifices his personal interest to the collective interest. A third cause determines special characteristics in the individuals of a crowd which are quite contrary at times to those presented by the isolated individual. Le Bon further notes that contagion is neither more nor less than an effect of this suggestibility which he observes is much like hypnosis. The individual is no longer conscious of his acts.

He is no longer himself, but has become an automaton who has ceased to be guided by his will. -Le Bon (1896, p. 12)

Le Bon also devotes a large part of his work to how to take advantage of crowds and how to use the suggestibility of the crowd. He notes that someone speaking to a crowd should use simple ideas, not try to use proof but instead affirm and exaggerate and also repeat key points often. He consistently notes that crowds are not just the source of civil unrest, but are also capable of great acts of heroism. These might be some of the reasons his work has been so influential.
1.4.1 Deindividuation. 75 years later Le Bon’s influence can still be seen in an article by Zimbardo (1970) fittingly titled "The Human Choice: Individuation, Reason, and Order versus Deindividuation, Impulse, and Chaos". The idea here is that we become deindividuated through among other factors anonymity, shared or diffused responsibility, large groups, sensory overload and altered states of consciousness such as through alcohol, drugs or sleep deprivation. This leads to a minimization of self-observation-evaluation and concern for social evaluation which in turn leads to weakening of controls based upon guilt, shame, fear and commitment and a lowered threshold for expressing inhibited behaviours. The outcome here is an emotional, impulsive, irrational, regressive, high-intensity, self-reinforcing behaviour which is difficult to terminate. Le Bon’s idea of contagion also comes into play here, Zimbardo names this hyper-responsiveness or "contagious plasticity" to behaviour of proximal, active others. At extreme levels deindividuation leads to the group dissolving as its members become autistic in their impulse gratification. In other words, we lose our ability to reason and instead act on our instincts. Zimbardo also pushes the point that the context is not important, consider the following quote:

In addition, the behaviour must not be under discriminative stimulus control. It must be unresponsive to features of the situation, the target, the victim, or the states of self which normally evoke a given level of response or a competing response. -Zimbardo (1970, p. 259)

This is in sharp contrast with the more contemporary theories which we shall now explore.

1.4.2 Social Identity Theory. Social identity theory distinguish between our personal identity and our social identities. Personal identity refers to self-categories that define the individual as a unique person in terms of his or her individual differences from other (in-group) persons. Social identity on the other hand refers to social categorizations of self and others, self-categories that define the individual in terms of his or her shared similarities with members of certain social categories in contrast to other social categories (Turner & Oakes, 1994). In other words, personal identity refers to how we are unique compared to other individuals, while social identity refers to our self understanding as a member of a social category, as contrasted to members of other social categories. Two processes are active in the categorization of distinct groups, namely comparative fit and normative fit. Comparative fit is a process by which we tend to categorize a collection of people as a group to the degree that intragroup differences are perceived as smaller, on average, then intergroup differences within the relevant comparative context. Normative fit means that we also tend to categorize groups according to how well they fit with our normative beliefs and theories about the the social category (Turner & Oakes, 1994). So basically, the more different two collections of people are and the more these two collections fit our normative beliefs, the stronger we categorize them as separate groups. It is important to note that this is all contextual and subject to constant change as the social context changes. Turner and Oakes (1994) makes an important point:

The personal self is not more real, basic or authentic than the collective self. They arise from the same general processes, and both are aspects of the normal
variation of the self, a variation built into its function. -Turner and Oakes (1994, p. 460)

While social identity theory provides an attractive basis for explaining crowd phenomenon by shifting social contexts and self-categorization it fails to provide a framework for analysing the unfolding dynamics between groups. The balance between social determination and social change is hard to fit into the social identity theory and hence the elaborated social identity theory was designed to enable just such an analysis (Reicher, 2004).

1.4.3 Elaborated Social Identity Model. To fully understand crowd behaviour and especially crowd conflict, we need to take into account the complex and dynamic interactions between groups. Reicher (1996) studied a crowd conflict between students and the police during a demonstration in 1988 against the British government’s plans to convert the student grant into a loan. He found that the event was best described from a social identity perspective while taking into account complex and dynamic interplay between the students and the police. As Reicher puts it:

What emerges from Westminster Bridge is context should not be seen as an external reality that determines human actions and perceptions. Rather context is itself produced out of actions on the basis of categorization. Moreover, rather then categorization and context being opposed terms, it has been shown that the categorizations employed by a first group may, as a function of intergroup power relations, form the concrete context in which a second categorizes itself, perceives the first and acts in turn towards it. -Reicher (1996, p. 132)

The Elaborated Social Identity Model (ESIM) suggests that crowd conflict typically arise when an out-group categorizes the crowd in a different way then participants in the crowd does, and this group has the power to enact this understanding of the crowd over and against the resistance of crowd members (Drury, Stott, & Farsides, 2003). This out-group is typically the police and an interesting pattern has been shown in several different studies of crowd conflict regarding mainly demonstrations (Drury & Reicher, 1999; Reicher, 1996) and football violence (Stott & Reicher, 1998). Crowd conflict typically arise when police view the crowd as a threat or view actions within the crowd as illegitimate and act upon the crowd in an indiscriminate way. This is in turn viewed by crowd members as illegitimate action by the police, resulting in a previously heterogeneous crowd coming together under a common social category, sharing a common relationship of threat in relation to the police. Crowd members increasingly extend the in-group categorization from that of the smaller group of friends they are there with to encompass the full crowd. This in turn enhances their expectations of mutual support, and hence power among the in-group, who now feel more able to respond to the out-group. Because the police action against the crowd is viewed as illegitimate, actions against the police increasingly becomes viewed as legitimate, and the previous minority in the crowd advocating hostility against the police may now be viewed as prototypical members of the crowd which increases their social influence. When an increasingly larger part of the crowd acts against the police, this in turn confirms the police view of the crowd as a threat, making it a self-fulfilling prophecy.
The police perspective on crowds has been studied in an interview study by Stott and Reicher (1998) and a questionnaire study by Drury et al. (2003). The studies found that while police officers with different ranks in the UK view crowds as heterogeneous and mixed, they also construct a dichotomy between a powerful minority, capable of exerting social influence in the service of violence and disorder, and a majority, who are unable to resist this influence. Whether or not the police officers viewed the crowd as a homogeneous threat was inconclusive in the studies, but they recommended strict control and quick intervention to prevent the development and escalation of crowd conflict.

1.4.4 Aggravation and Mitigation Model. The Aggravation and Mitigation Model was developed independently of ESIM, but supports and complements its main conclusion (Hylander & Granström, 2010). It is a grounded theory that applies to the area where it was derived, i.e. Swedish political demonstrations and protests and it has also recently been used in the study of football events. In a literature-review of crowd behaviour at mass gatherings Zeitz, Tan, Grief, Couns, and Zeitz (2009) notes that a majority of research focuses on crowd behaviour in the context of violence or conflict. While the AM-model is also concerned with the context of potential violence or conflict it focuses specially on mitigation processes, suggesting that peacemaking strategies are essential for avoiding crowd conflict and that they are not the same thing as merely the absence of aggravating strategies (Hylander & Granström, 2010; Rosander & Guva, 2012). The AM-model suggests that when aggravating processes dominate, conflicts escalate and members of the groups involved lose trust in each other. If mitigation dominates, conflicts de-escalate and mutual trust increases. Especially important is mutual trust in the other groups peaceful intentions. The AM-model focuses on three different social processes, categorizing (negative stereotyping/differentiating), organizing (creating chaos/peaceful organizing) and mutual treatment (provoking/disarming).

**Categorization** an aggravating process happens when one group negatively stereotype other groups and treat them as a dehumanized, anonymous mass and a potential threat. As a mitigating process it involves the ability to see that the behaviour of both out-group and in-group members can be good or bad, the distinction "us" and "them" becomes less important and the actions of for example the police is viewed as legitimate. Differentiation is high and actions by single individuals are not viewed as representing a common stance of the group.

**Organisation** as an aggravating process is anything any of the involved parties does that contributes to confusion and the creating of chaos (or anything the other group see as chaotic). This can be anything from rumours, sudden inexplicable actions or lack of information and they often result in fear as a response. Unexpected actions without explanation or 'knowledge' based on rumours tends to be viewed as illegitimate by the other group. Mitigating processes include anything that can contribute to avoiding uncertainty such as clear rules and information.

**Mutual treatment** as an aggravating process means letting oneself be provoked by the other group, or acting in a provoking way. Provoking behaviour can be intentional or unintentional, what is seen as provoking by one group may not be seen as provoking by the other group, such as police riot uniforms and helmets. As a mitigating process mutual treatment involves disarming, not letting one be provoked by actions and instead interact with the other group in a friendly way. If mutual treatment mitigation is high, provoking
behaviour by single individuals can lead to self-policing behaviour by others in the group, also contributing to de-escalation of the conflict.

1.5 Research questions

- Resilience
  1. In what circumstances do the safety organization adjust itself under expected and unexpected conditions relating to crowds?
  2. In what ways do the safety organization adjust itself during these conditions?
  3. What resilience strategies can be found for managing regular threats?

- Crowd Psychology
  4. Social Identity
     (a) What social identities are salient among the visitors?
     (b) In what situations does a change in social identity happen?
  5. Aggravation and Mitigation Model
     (a) How do visitors and the safety organization categorize each other?
     (b) What organizing elements can be identified?
     (c) How do visitors and the safety organization treat each other?

1.6 Delimitations

The study took place at a festival in Sweden and can therefore only draw conclusions about this specific festival. The Aggravation and Mitigation Model is a model for potential crowd conflict situations and the research questions linked to it will be answered mainly for such contexts, that is, in situations where the safety organization restrict visitors movement in some way, such as when a stage get overcrowded.
2 Method

Given the open-ended purpose of the study a multitude of different qualitative data was collected through various means. An overview of the process can be seen in Figure 2. During the months leading up to the festival the planning material for the festival was continually being reviewed and participatory observations and unstructured interviews were made at a few occasions during planning. This had the purpose of getting an understanding of the planning of the festival to better prepare the data-collection during the event itself.

The researcher arrived at the site of the festival 11 days before the festival started and participatory observations were being made from this time. They continued through the five days that the festival took place as well as the day after. During the weeks before the festival four days were spent actively participating in the planning of certain routines at the festival and three days were spent helping out with the perimeter security of the festival area that was being established. The rest of the days were spent preparing the last details of the study as well as participating in meetings and other planning-work, both in the safety-office and at the festival area. During the festival the researcher focused solely on participatory observations while six assistants performed structured interviews with visitors as well as made some structured observations of events. The collected data was analysed by thematic analysis (Braun & Clarke, 2006).

![Figure 2](image-url)

*Figure 2*. A timeline for the different stages of the study.

2.1 The researcher’s role and bias

The researcher had previously worked within the safety-organization at the specific festival for three consecutive years and can thus not be said to be unbiased towards the organization or towards the safety work that it performed. Indeed it was this previous work that let the researcher take an official role in the safety organization in working beside the crowd managers, giving access to the organization, the planning material and the festival itself in a way which would otherwise not be possible. The assistants were also a part of the safety-organization directly answering to the researcher, although this was mainly for practical concerns such as giving them access to the festival area. Despite officially being a part of the organization the only task of the researcher and assistants during the festival
was to do research, a task in which the organization had no say. The researcher and the assistants were never dressed as safety-staff, but instead wore their own clothing.

Drury and Stott (2001) argues that subjective involvement is necessary in research on crowd conflict because such events should be understood as intergroup encounters. They further note that there are three types of bias especially relevant in this case; partiality of access to materials, partiality in the researcher’s observations and partiality in the analysis. They further outline a method of dealing with partiality of observations and partiality in the analysis, namely treating the collected data as only another point of data and not as an objective version that can stand above and arbitrate between competing accounts. This report adopts this view when it comes to events and data about events was triangulated from multiple sources when this was possible. Instead of the researcher gathering data from the visitors assistants were used, which was yet another way of dealing with partiality of access to materials and observations when it came to the visitors point of view.

2.2 Data collection

The main body of data was collected using an ethnographic approach (Emerson, Fretz, & Shaw, 1995). Interviews with both visitors and safety staff and participatory observations supplemented with pictures and some videos are at the core of the study, but a multitude of other data was also collected through various means such as structured observations made by the assistants. Much of the safety planning material was reviewed and is another source of data, evaluations made after the festival is yet another. The collected data is summarized in Table 4.

Table 4
Collected Data

<table>
<thead>
<tr>
<th>Data type</th>
<th>Data volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field notes</td>
<td>70 pages</td>
</tr>
<tr>
<td>Visitor Interviews</td>
<td>84 interviews</td>
</tr>
<tr>
<td>Structured Observations</td>
<td>31 observations</td>
</tr>
<tr>
<td>Pictures</td>
<td>200 pictures</td>
</tr>
<tr>
<td>Videos</td>
<td>26 videos, 2 hours</td>
</tr>
<tr>
<td>Planning material reviewed</td>
<td>~1200 documents</td>
</tr>
</tbody>
</table>

According to Emerson et al. (1995) ethnographic research involves two distinct activities. First, the ethnographer enters a social setting and gets to know and develops ongoing relations with the people in it, participating in the daily routines while observing what is going on. This basic research approach is often called participant observation. Secondly the researcher writes down in regular and systematic ways what is observed and learned in this participation. The result of this writing is the researcher’s field notes.

To grasp what is meaningful and important for others, the ethnographer seeks a deep immersion in their world. This immersion is what lets the field researcher see from the inside how people lead their lives, carry out their activities and what is meaningful to them. Immersion involves both being with other people to see how they respond to events as they happen and experience these events, as well as the circumstances that give rise to them, for
oneself. Because of this immersion, no field researcher can be a completely detached and neutral observer, and indeed this is not the point (Emerson et al., 1995).

### 2.2.1 Participatory observations.

The participatory observations were made in two seamless stages, during planning and during the actual festival. In both stages the focus was on the task of crowd management, but because this is a task deeply intertwined with the rest of the organization the focus was still intentionally broad. While the main focal point was crowd management, special attention was also given to the interaction between the safety organization and the visitors as well as diverging crowd behaviour. The researcher adopted the role of a novice wanting to learn more about crowd management, a role where questions and observing is common. During the planning stage the focus was on understanding what factors the crowd manager was mainly concerned with during planning and what external factors affected his work, as well as what specific conditions were present and needed planning for at this years festival.

During the festival itself the focus was twofold. The main focus was understanding the crowd management-work by observing both the crowd manager and the deputy crowd managers. In addition to this different events were also observed regardless of the crowd managers involvement. Some high-risk events were decided on beforehand through the risk analysis for concerts and some unexpected events that cropped up during the festival was observed as well. These events were both stumbled upon by the researcher and actively sought by listening to the communications radio traffic of the safety-organization. During these events the focus was on the interaction between the safety organization and the visitors in addition to the crowd management-work.

Being a part of the safety-organization meant that the researcher could move freely all over the festival area, including backstage- and otherwise restricted areas, as well as attend meetings and workshops. Most days two meetings were attended, a start-up meeting for the safety managers early in the afternoon as well as a brief meeting after the closure of the festival. Because the researcher had an official role in the organization many people that were not directly related to crowd management did not know research was taking place at all. The head safety area managers were all informed of this during the first start-up meeting and those interviewed or under direct observation were also informed of the study and its purpose.

Notes were taken in a small notebook that was always carried in a pocket. Often notes were taken visibly 'in the open' but at times where it felt unnatural or especially sensitive to take notes, the notes were written down at a later time. Emerson et al. (1995) argues that taking notes visibly establishes note-taking as a natural part of the researcher’s role, but further argue that there are many times where taking notes can be disruptive because of the sensitive nature of the situation. The notes were most often written up into a longer text about the day before going to bed at night, but at times this was not possible due to high workload and few hours of sleep and at these times the notes were written up as soon as there was time, at a slow period during the next day or together with the next days field notes. At times pictures were taken of interesting events, objects or places and at a few crowd events video was recorded by the use of a camera-equipped smartphone.

In total 70 pages of full field notes were collected, as well as 200 pictures and 28 videos amounting to 2 hours of video.
2.2.2 Visitor interviews. 85 structured interviews with visitors were performed Wednesday to Saturday. One interview was excluded because the interviewee chose to cut the interview short after only a few questions, but the other 84 interviews were completed in full. A further 88 people chose not to participate in the interview, giving a response rate of 48.5%. Of the respondents 48 were women and 36 were men, the mean age was 25.5 years (SD = 10.8). At what time the interviews were performed can be seen in Table 5.

<table>
<thead>
<tr>
<th>Day</th>
<th>Afternoon</th>
<th>Evening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Thursday</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Friday</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>Saturday</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>41</td>
</tr>
</tbody>
</table>

The interviews were carried out by six assistants using an interview-guide detailing the questions. Five of the assistants were undergraduate students of cognitive science all with some formal training in interview-technique and the sixth was a friend recruited through one of the other assistants. The assistants had been briefed about the study and its purpose beforehand and received training at the arrival at the festival. This included the procedure for the interviews, the questions and their purpose as well as some reminders about interview-technique such as not asking leading questions and how to effectively take notes. The assistants worked in pairs where one acted as interviewer and the other wrote down the responses, these roles were switched between each interview. To avoid sampling bias the pair chose an imaginary line on the ground and the person that was not going to perform the interview chose a number x, the interviewer then asked the x:th person walking across the imaginary line if they wanted to participate in an interview which would take about five minutes and was completely anonymous. The interviews were not recorded since it was deemed as overly intrusive and also because there would not be enough time to transcribe them, instead notes were taken and written up after the interview. After the interview the interviewee was given a handout explaining the purpose of the study and providing an email-address to the researcher if any questions were to come up.

The interview had 20 questions and some further sub-questions depending on the answers given by the interviewee. The full interview-guide can be found in Appendix A. The main goal of the interviews were to probe the interviewees’ view of the festival, its visitors, the safety personnel and if they had seen any violence or thought violence was prevalent at the festival. The purpose of this was to explore their attitudes, expectations and presumptions and in extension their social identity.

One question was deemed to be a bit complex, so a visual aid was prepared. The question was "If a local newspaper about the festival interviewed you with a question in a short-column like this [show newspaper-column], what would you then like it to say under your name?" and the visual aid was a made-up short-column with xxxxx where usually it would say something like the persons occupation or where they are from. The idea was to get at how people categorized themselves at the festival. The visual aid can be seen in
Appendix B.

2.2.3 Structured observations. 31 structured observations were made by the assistants during the festival. The focus was inter-group behaviour but other observations were encouraged as well if they were deemed interesting for the purpose of the study, the full guide can be seen in Appendix C. The notes were taken directly onto a observation-report that mirrored the guide. The structure of this report consisted of a triggering event, a description of the involved and the context, the course of events, a description of the communication during the event and their own reflections of the event. The atmosphere of the event was noted as positive/negative, calm/energetic and structured/chaotic. Things like time, place and which observer was taking notes were also noted.

2.3 Analysis

In the study two different qualitative analysis-methods were combined to best analyse the data. First, thematic analysis (Braun & Clarke, 2006) was chosen as the main analysis, but was found hard to apply in full extent to the visitor interviews. The answers were often quite short and because the context for each expression was not very rich, a thematic analysis was not deemed as the best analysis method. After initial familiarization with the data it was found that specific keywords were repeated throughout the interviews and a summative content analysis (Hsieh & Shannon, 2005) was performed to capture the use of these keywords. The results from the summative content analysis was then included in the overarching thematic analysis. Before further outlining exactly how the analyses were performed in this study, a brief look at the theoretical foundations for them is in order. It will be followed by how the data was prepared and then a detailed account of how the analysis took place will be presented.

2.3.1 Qualitative Analysis Theory. According to Braun and Clarke (2006) thematic analysis is a widely used qualitative analysis-method that consists of searching for repeated patterns of meaning across a data set. It is a highly flexible method that can be either inductive and data-driven or deductive and theory-driven. If used as an inductive method, the researcher does not try to fit the data into pre-existing themes or preconceptions and as such it bears some resemblance with grounded theory. If used as a deductive method it is driven by the researchers theoretic or analytic interest in the area and tends to be more analyst-driven. Thematic analysis can either be concerned with semantic themes, or with latent themes. If it has a semantic approach, the themes are identified within the explicit or surface meanings of the data, the theorist is not concerned with anything beyond what a participant has said or what has been written. In contrast, a thematic analysis at the latent level goes beyond the semantic content of the data and tries to identify underlying ideas, assumptions and conceptualizations that is shaping or informing the semantic content. The researcher identifies themes, choose the ones of interest and report them to the reader and thus it is misleading to say that themes reside in, or emerge from, the data, as this denies the importance of the active role that the researcher plays in the process (Braun & Clarke, 2006).

Summative content analysis can be said to tread the line between being a qualitative and a quantitative analysis method, eventually ending up on the qualitative side. Hsieh and Shannon (2005) describes summative content analysis as starting out by quantifying specific words or content in text with the purpose of understanding the contextual use of the words
2.3.2 Preparing the data. Because of the sheer amount of planning data the corpus was processed into a more manageable data set only including the planning documents that were considered to potentially include planning for crowd safety or information or communication to the safety personnel or the visitors at the festival. This also included plans for communication and information. Some documents containing meeting notes were further excluded because they were judged to contain classified information. The chosen data set contained among other things presentations, evaluations from last years festival, job/role descriptions, plans, routines and maps. This set was then included in the total data set also consisting of field notes, visitor interviews and structured observations.

The visitor interviews were entered into an Excel-document with a column for each question. Since the raw data consisted of hand-written material there were a few times where the researcher had to interpret the data but there were very few occasions where a word could not be read at all. In these cases the meaning of the sentence or utterance in whole could still be interpreted as a whole.

When the field notes were written up at the end of the festival days this was done in digital form. After the festival each separate note or story was entered as a separate note in the note taking-program Evernote to allow data-tagging. The creation time of the digital note was then manipulated to match the time it was taken during the festival to preserve the timeline and allow searching by date and time. Every note was transferred in full to Evernote and no notes were excluded.

Each structured observation was entered in full into Evernote as a separate note and no observations were excluded.

The pictures and video taken during the festival were reviewed and it was found that they were all linked to specific fieldnotes. Because of this and time constraints the pictures and video were not included in the data-set to be analysed separately, but instead they were used as complements to the fieldnotes during the coding of these. In a few cases when a fieldnote was incomplete, or incoherent with its supplementary material, it was complemented with a textual summary of the accompanying video or picture to allow for a more complete and accurate account of the observed event by triangulating it from multiple sources.

2.3.3 Analysing the data. Summative content analysis was performed on the visitor interviews by identifying keywords used in the answers to different questions. These were aggregated, refined and then interpreted for their latent meaning. A second stage of the analysis included the answers that did not use the specific keywords, but were still judged to match the underlying meaning identified in the stage before. In practice the analysis was performed both by color-coding and by using parallel columns to tag data in Excel. The processed interviews were then included in the data set of the thematic analysis. The result was that common themes that the visitors talked about were included in the thematic analysis.

The thematic analysis was performed at the latent level, going beyond the surface
meaning of the data in trying to understand the underlying structures. It was also deductive and theory-driven and the data was analysed in the light of previous research and the theories and frameworks presented earlier in this thesis. The first step of the analysis consisted of reading through the material multiple times to get familiarized with the data. During the first reading some main events were identified and all data relating to these specific events was tagged so that all notes relating to them could be browsed regardless of when the data was collected. These tags were not treated as a part of the analysis, but were rather created to facilitate the later steps in the analysis, helping in identifying themes over time and in creating narratives to be included in the thesis.

Because the research questions were linked to two completely different areas of research, the analysis was then divided into two separate ones. The first analysis was concerned with resilience and Resilience Strategies and the second analysis was concerned with social identity and the Aggravation and Mitigation Model.

Each of these analyses were performed using the same steps, the difference was merely which theoretical framework was used to create initial themes and understand the latent meaning of the data. To put it another way, different theoretical glasses were used. The steps performed were coding, aggregating and refinement, repeated until the themes were fully worked-out. This meant that the researcher was satisfied that the themes that had been developed best described the data. Throughout these steps the preliminary findings were written down and later reworked and writing was a fundamental part of the analysis process. The coding step consisted of going through the data and coding it to match the current themes. The aggregating step consisted of collecting the data linked to a specific theme in one place. Because of the capabilities of the note-taking program used this was mostly automatic, but this step also consisted of linking the tagged notes to the visitor interviews, planning data, pictures and videos. The third step, refinement, consisted of going through the different themes and looking for better ways to describe the data, eventually resulting in new, refined, themes. The process then started over with a new round of coding.

After these analyses were completed a rough draft of each part of the result was finished. These drafts were then refined into a coherent text, which is to be considered the final stage of the analysis. Excerpts from the data were chosen and translated from Swedish to English by the researcher to be included in the final report. As a part of the writing process figures were created for the Resilience Strategies that had been discovered during the analysis, in an effort to better visualize them.
3 Results

The results contain three parts, the first two dealing with the broader purposes of the study. In the first section, findings about the safety organization’s work with crowds will be presented and analysed. In the second section, findings about the visitors view of themselves and the safety organization is presented and analysed. The last part takes a quick look at how the results of the first two parts can be linked together.

3.1 Crowd Management and Resilience

During the festival, several plans and routines were observed relating to how the safety organization adjusted itself to meet expected and unexpected conditions relating to crowds. In this part these plans and routines as well as a few examples of their execution will be presented in the sections Crowd management routines, Crowd pen density and Entrances. The section will end with a summary of when and how Adjusting to crowds happened as well as presenting some of the Resilience strategies the organization used, analysed and described in the framework presented by Rankin et al. (2011). The section will start out with a summary outlining the three Crowd Managers (CM) roles and usual tasks. This description is based on a semi-structured interview with the crowd manager, informal interviews with the deputy crowd managers as well as observing their work and serves as a background for the following results.

3.1.1 The role and work of crowd managers. The CM was responsible for all the planning of crowd-related matters before the festival while the deputy CMs worked only during the festival-week. This planning involved among other things creating crowd management routines, calculating the stages maximum visitor-capacity, creating risk profiles for the performances and modelling how the front of stage barriers should be built. Because every static structure at the festival area hinders or changes the movement of crowds a large part of the crowd managers planning work involved modelling for example how the placement of stages affected their visitor capacity. Other structures such as large tents, toilets, food-stands also change how the crowd moves and behaves and the CM was deeply involved in the placement of these, talking to many different parts of the festival-organization. A 3d-model of the festival-area was used as the basis for these discussions, which were most prevalent between the safety department, the production department and the site department.

During the festival the CM monitored the state of the overall crowd situation and kept track of where people were right now as well as predicted where they would be in the future. An especially telling quote from the semi-structured interview was "Another parable is us being like the weather services for crowds, trying to forecast where they will be at different times". While the deputy CMs each had a separate area to monitor the CM moved freely all over the festival area. Office-work such as looking at and updating risk profiles was also common.

The first deputy CM mainly moved between the two largest stages at the festival. These stages were close by proximity and never played at the same time, allowing the CM to always be present when one of the stages were playing. The main task of the first deputy CM was to assist in moderating the crowd pen density as well as to monitor the crowds at these two stages. More of the work will be detailed in the section Crowd pen density.
The second deputy CM ambulated a larger area consisting of the rest of the festival. Stage three and four by size were located at the opposite end of the fairly stretched festival-area from stage one and two and these stages as well as the crowds moving between the two somewhat separate parts of the festival were the main focus of the second deputy CM. A lot of the smaller stages had a quite limited visitor capacity meaning that the crowd management routines for these stages were fairly often activated. These routines were most often, while not always, monitored by the second deputy CM.

3.1.2 Crowd management routines.

A crowd management routine is a predetermined way to manage various phenomena around crowd flow and gatherings of people. A crowd management routine - in contrast to an emergency plan, for example - is rarely initiated by a dramatic event. The purpose of the routine is, instead, to prevent dramatic events from happening - that is, before something serious happens. - Event Safety Guide (2012, p. 160)

A lot of the crowd management-work revolved around different crowd management routines. Because these are in their essence a predetermined way to handle crowds, most of the actual work of responding to crowd movement took place in the form of one of these routines. While the work at the entrances to the festival and the camp-site can be said to be a form of crowd management routine as well, this work will primarily be looked at in the section Entrances. Because the two largest stages had multiple barriers, creating crowd enclosures, these stages had routines for managing the Crowd pen density, also described in a later section. The following quote is taken from one of the templates for crowd management routines at the festival:

The purpose of a crowd management routine is to in a structured way handle large crowds and reduce the risks if the crowd gets too large for the area in question.

Crowd management routines (CMR) existed for most of the festival stages. The CMR for each stage was divided into four different levels dubbed with code-names, corresponding to how full the stage was at the moment. The first level was escalated when the stage was about 70% full and the last was escalated when the stage was completely full, effectively closing off the stage. One or several persons were detailed as alarm-functions or decision-makers in charge of escalating or de-escalating the CMR. Each level detailed how to act at that particular crowd density, as well as who was involved in the work, what necessary communication had to take place and what material, for example in the form of signs, was required. These routines involved several people in different roles and were in the form of role-specific step-by-step instructions, so that each person involved just had to look at what their actions should be and follow the instructions. They were written out in the form of laminated A6-papers with instructions on one side and a map and overview on the other. These were handed out to all the safety managers (SMs) involved in the CMR, so that they could be carried around and consulted in the field. A generalized version of a CMR based on the template used by the festival can be seen in Table 6 and gives an overview of roughly in what order things were supposed to happen in a CMR.
Table 6  
*A generalized version of a crowd management routine*  
*CMR: Crowd Management Routine, SM: Safety Manager, CM: Crowd Manager*

<table>
<thead>
<tr>
<th>Level</th>
<th>Role</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Delta</td>
<td>Alarming SM</td>
<td>At 70% full, calls out &quot;CMR x is at level Delta&quot; on the radio</td>
</tr>
<tr>
<td></td>
<td>All involved</td>
<td>Confirms on the radio</td>
</tr>
<tr>
<td>3. Caesar</td>
<td>Alarming SM</td>
<td>At 80% full, calls out &quot;CMR x is at level Ceasar&quot; on the radio</td>
</tr>
<tr>
<td>Troubleshooter SM</td>
<td>Confirms and prepares to send a troubleshooter-group at the next level</td>
<td></td>
</tr>
<tr>
<td>Festival Area SM</td>
<td>Confirms and immediately sends a group to the location. The group takes over the responsibility for the CMR and prepares to build the structure that will handle the crowd at the next level.</td>
<td></td>
</tr>
<tr>
<td>CM</td>
<td>Confirms on the radio</td>
<td></td>
</tr>
<tr>
<td>2. Bravo</td>
<td>Festival area-group</td>
<td>At 90% full, calls out &quot;CMR x is at level Bravo&quot; on the radio. The group then performs a soft close-down, reducing the rate of admission so that a line forms outside.</td>
</tr>
<tr>
<td>Troubleshooter SM</td>
<td>Confirms and sends a troubleshooter-group to the location to help the festival area-group</td>
<td></td>
</tr>
<tr>
<td>Stage SM</td>
<td>Confirms on the radio</td>
<td></td>
</tr>
<tr>
<td>CM</td>
<td>Confirms and if needed heads for the location</td>
<td></td>
</tr>
<tr>
<td>1. Alpha</td>
<td>Festival area-group</td>
<td>At 100% full, calls out &quot;CMR x is at level Alpha&quot; on the radio. The group then performs a hard close-down, closing the area off completely and informs the remaining audience that the area is full.</td>
</tr>
<tr>
<td>Troubleshooter SM</td>
<td>Confirms on the radio</td>
<td></td>
</tr>
<tr>
<td>Stage SM</td>
<td>Confirms on the radio</td>
<td></td>
</tr>
<tr>
<td>CM</td>
<td>Confirms and supports if needed</td>
<td></td>
</tr>
</tbody>
</table>

Four CMRs regarded smaller stages and because these had a quite limited visitor capacity they were often escalated and de-escalated several times a day during the festival. The two CMRs dealing with stage 3 and 4 in contrast were more complex and involved a lot of information going out to visitors, potentially closing off large areas of the festival and demanded large personnel-resources. These were not escalated and de-escalated as often and had a heavier impact on the festival and the organization as a whole when they were. One of the CMs always confirmed via radio when a CMR was escalated or de-escalated and most of the time all three CMs knew at what levels the different routines were at the moment. The CMs mainly had a monitoring and advisory role in the CMRs, both in theory and in practice, and their presence were most often required only at higher levels of the CMRs. Next will be a look at a few different events involving CMRs that took place during the festival.
3.1.2.1 **Stage 7, Tuesday.** Stage 7 was a smaller indoors-stage with a maximum visitor capacity of 1000 visitors and because it regularly got full it had fencing set up for a cue, from here on called the pen. The pen consisted of fences that were about 1.2 meters high and were not designed for handling pressure, called "bike racks". The area outside of the stage as well as a timeline over the events about to be described can be seen in Figure 3. Tuesday was the first day of the festival and only parts of the festival area was open. The five largest stages did not have any scheduled performances and most scheduled activities on the smaller stages were not music performances but rather debates and other kinds of performances. One artist starting at 22:00 at stage 7 was a DJ playing electronic music and one hour before the show was supposed to start, a cue 100 meters long had formed outside. At 21:10 the second deputy CM calls to the CM on the radio saying "Things are starting to get a bit messy here" whereby the CM responds "Start informing people, you will not get in". At least one group of safety volunteers as well as some deputized security were there to hinder people trying to jump the fence to get ahead in line and at 20:20 I observed just that happening. The head of safety for the festival was also there and said to the CMs and SMs around him: "We need to count the visitors and then tell the cue after that point that they will not be able to get in. We also need to let people in really slowly to avoid a surge of people trying to get in".

![Figure 3](image-url)  

*Figure 3.* An overview of the event taking place Tuesday evening on Stage 7

At 21:30 a lot of different chants and cheering was taking place in the cue and the atmosphere was quite good. The chanting continued every now and then throughout the
whole episode and the noise from people talking was loud throughout, making it hard to communicate verbally at times. A girl, about 17 years of age, walked by and said despondently: *'He is the only thing happening tonight that is worth seeing'*. The second deputy CM counted that there was 300 people in the pen, but a lot more people was cueing outside of it. At 21:35 large signs saying *'Area is full'*. was being shown at the point where the second deputy CM had counted to a 1000 visitors, trying to disperse visitors that had no chance of getting inside. A lot of visitors started trying to find a way to skip into the line further ahead and the safety volunteers standing there were not at this point trying to hinder them and tell them to stand at the back of the line, meaning that the area outside the pen was getting more and more crowded with people. At this point the line was not at all ordered and a large clump of people was forming. The head of the deputized security at the festival was present at the entry to the pen and said to the deputized security present: *'It is time to keep a damn low profile. Be nice and think about what you say.'*. A line of deputized security and volunteers tried to push the cue so that it gets thinner without success. The deputy head of safety is present and calls in 25 safety troubleshooters to help out.

At 21:45 entry from the pen into the stage started, but people outside of the pen was not yet being admitted into it. At this point about 20 safety volunteers were present as well as a total of about 8 deputized security. Five of the deputized security were at the entry to the pen, three were standing inside the pen with a few safety volunteers, keeping the fence upright by pushing it. The force created by the crowd against the fence was at this point so high that it would have easily fallen if the crew inside of the pen would not have kept it upright by force. Suddenly a large surge in the crowd almost pushed the fence and the crew inside the pen down to the ground, but they managed to push the fence back upright. One minute later another large surge happened and the fence almost got pushed down again, but was kept up by the crew, but 5 seconds later the close-by higher fence towards another area fell and a lot of people fell to the ground. When people slowly got up, the inertia of the fence pushed it back up somewhat. The deputy head of safety for the festival quickly got inside and pushed the fence up, meanwhile calling for backup on the radio. In the next few minutes groups of safety volunteers started to arrive and was put to work. The arriving volunteers did not seem to know what to do, but after a while they encapsulated all of the crowd, making sure that no one else could get into the group of people waiting. This was not something that was detailed by the CMR, or any other routine, but was instead an on-the-spot improvisation by the present SMs. The idea seemed to be to limit the crowd pressure by not allowing anyone new to enter the crowd, so that when people were let inside to the stage the pressure would slowly decrease. The pressure was however already high and multiple crowd surges continued to happen over the next 20 minutes or so. During this time quite a few people left the crowd and some looked quite shook-up. At one point a deputized security-guard emerged from the crowd, half-carrying a girl, about 18 years of age, seemingly having a panic-attack. At about 22:10 one of the large signs saying *'Area is full'*. had been moved up to the entry to the pen and soon thereafter several smaller signs were also lifted and safety volunteers started informing people that the stage was completely full. After this the crowd dispersed quite quickly. A lot of people seemed frustrated and irritated and went up the side of the pen to where the entry to the actual stage was located and were seen arguing with volunteers and deputized security that they should be let in,
but the atmosphere was never violent or aggressive. No visitors required medical care after the event.

Based on informal interviews with some of the involved key personnel after the event as well as field notes and film-footage taken during the event itself a short analysis follows. Because the artist was more popular than anticipated and played on a small stage on a day and time where not much else was playing a lot of people started cueing much earlier than anticipated. Since it was the first day most volunteers had not yet been properly trained in the CMRs and had little experience in handling this type of situation. When informing people further back in the cue that they would not be able to get in, many tried and succeeded in sneaking ahead in the cue, joining the already large crowd in front of the pen, creating a high density and pressure towards the fence of the pen. When more volunteers arrived an improvised strategy was formed, encapsulating the crowd to make sure that the pressure did not build further, slowly alleviating pressure as more people was being let into the stage. When the whole stage was full, the crowd was informed and quite quickly dispersed.

During the following night-meeting it was decided that the first and second deputy CMs, the stage SM and the festival area SM was to evaluate and possibly change the stage 7 CMR during the next day. During this meeting they agreed that the CMR at its core was good, but needed a few tweaks. The pen was rebuilt somewhat, but more importantly, from Wednesday and onwards volunteers were on location early with cordon tape, making sure that the cue was thin and ordered and that no one was able to skip ahead in line. While there were other times that there was a large cue to this stage, no further incidents were noted and the CMs as well as the SMs involved thought that the CMR worked well after this.

Worth noting in this particular scenario is that when the CMR (a resilience strategy in itself as shall be shown) did not work as expected, the safety organization adjusted its functioning to be able to handle the situation. This adjustment was in itself a form of semi-improvised resilience strategy, namely encapsulating the crowd by use of troubleshooter-personnel. A third resilience strategy was the monitoring of CMRs functioning during the day, allowing the safety organization to learn quickly and implement tweaks to the CMR as soon as the next day. A further analysis of ways in which the safety organization adjusted itself can be found in the section ‘Adjusting to crowds’ and the different strategies used to handle the situation can be found in ‘Resilience strategies.’

3.1.2.2 Stage 8, Friday. Friday evening at 20:45 I happened to be passing by stage 8, a smaller indoors-stage that had a maximum visitor capacity of 660 visitors. A part of the CMR for this stage, including a map, can be seen in Figure 4. Because this stage regularly got full, it had some limited fencing to provide structure for a cue and because I saw a large line stretching far beyond this fencing I decided to check how many people were already inside. At this stage a safety volunteer was always assigned to keep track of how many people had gone inside and when I checked about 500 people were inside. At 20:46 the stage SM used the radio to call out "Stage 8 is now at level Caesar" and everyone confirmed. It is not clear if the stage was already at level Delta or if the CMR was escalated straight to level Caesar. One of the festival area SMs was already at the location, but without personnel, and he went inside to fetch signs saying "Stage is full". Deputized security which are also a part of the CMR were also present. Thirty seconds later the stage
SM (also present outside of the stage) called out "Stage 8 is now at level Bravo" and everyone confirmed. The crowd density next to the fencing was at this point quite high and getting higher. The festival area SM and one of the deputized security guards stepped straight into the line that had formed outside of the fencing, holding large signs saying "Stage is full" overhead. The idea was clearly to get the people further back in the line to realize that the stage was indeed full and that they had no chance of getting in, thereby dispersing the cue. At the same time the speed of admission from the cue was lowered.

At 20:48 the stage SM called out "Stage 8 is now at level Alpha" and everyone confirmed. This corresponded to the stage being full and no further admission was being made. At 20:49 about 20 people from the festival area safety-group arrived and everyone started to inform the audience that the stage was full, both verbally and by using signs and laminated a4-papers and now the cue starts to disperse. After a minute or two about 80 people was still cueing outside. One girl, about 16 years of age, tried to run inside, but one of the volunteers stood in the way and talked her into leaving. Two other girls, about the same age, were crying outside because they would miss the show. Later, after a few people had left the stage, another set of people were let inside from the cue, most of which ran inside, jumping with joy. When I talked to the stage and festival area SMs afterwards they said that the crowd density in the cue and the pressure against the fencing was at no point dangerous, but left unchecked it could have created problems. At this stage several other uses of the CMR was observed and while this particular instance was more quickly escalated
then most others, it is a good example of how the CMR was used at this particular stage to both limit the access to the stage and handle any problems that emerged linked to the cue outside.

3.1.3 Crowd pen density. Most stages have a front of stage barrier built for withstanding the pressure from the crowd and has the purpose of separating the crowd from the stage. The area between the stage and the crowd area is called the stage pit and it is here that the safety personnel work. Their main task is to supervise the people close to the front of stage barrier and make sure that they do not get hurt, occasionally this means lifting them over the front of stage barrier. On most stages one front of stage barrier is sufficient, but on stages with large crowds, multiple barriers might be needed to make sure that the pressure from the crowd does not get too high in the front and this also means there are several stage pits manned with safety personnel. Other actions are usually taken as well to alleviate the pressure at large stages, such as using large screens to show the concert on, so that people standing further back do not push forward as much. A crowd pen is an area in front of a stage where the inflow of people can be controlled and halted so that the number of visitors and thereby the crowd density in the pen can be moderated. This requires multiple front of stage barriers and an entrance/exit for each pen. Two examples of how crowd pens can be built can be seen in Figure 5. The front of house (FoH) in the figure is where the sound- and light-technicians is positioned.

At the festival in question stage 1 had two crowd pens and stage 2 had one crowd pen. The main task of the first deputy CM was to monitor the crowd density in the crowd pens and support the stage SM in making decisions about when to open and close the entrances to the crowd pens. The stage SM was the decision maker of whether a crowd pen was full or not, but in practice always listened to the CM and most of the time, if not

Figure 5. Examples of crowd pens
always, the decision was a joint one. On both stages the stage SM was always positioned in the stage pit closest to the stage, leading the work in the pit, and the deputy stage SMs also had more or less fixed positions. The deputy CM in contrast had two quite different approaches depending on which stage was monitored. On stage 1 the FoH was a tent and on stage 2 (as well as the other outdoor-stages) it was a tower built with several levels. On stage 1 the deputy CM ambulated the whole stage pit, both the inner and the outer one, and monitored the pressure at different points as well as the density in the pits. On the roof of stage 1 there was a CCTV-camera that was being monitored in the safety office, letting the deputy CM get reports over the radio of what the bird’s-eye view looked like. On stage 2 the deputy CM was positioned at the top of the FoH-tower, always maintaining the bird’s-eye view in person. On both stages the communication with the stage SM and their deputies largely took place over radio on the stages’ corresponding radio-channels.

The decision of whether a crowd pen was full or not depended on a multitude of factors. The pressure against the front of stage barrier as well as the density in the crowd pen were the main factors, but many other factors was relevant as well, such as crowd behaviour and which artist was playing among other things. A particularly telling example took place during Saturday evening on stage 1. During a discussion between the stage SM and one of the deputy SMs the stage SM made the decision to close one of the crowd pens that had previously been open. The reason behind this was not that the crowd pen was overly full, but that the stage SM knew that the next song to be played was one where the artist usually agitated the crowd into a form of dangerous crowd movement. Because of this the stage SM wanted extra space in the pens to alleviate some of the possible danger. In the end the artist did not agitate this movement and while the crowd engaged in it anyway all went well.

Not only did the deputy CM monitor and support the decision to close or open crowd pens, but also made sure that opening and closing the pens was not in itself a risk. Many fans want to be as close to the artist as possible, meaning that the pressure against the entrances into the pens can potentially get quite high. To counteract this fences which blocked the line of sight were used so that one could not both cue to get into a crowd pen and watch the concert at the same time, alleviating the pressure against the entrance. At one of the entrances this fence had to be moved back and forth depending on if the pen was open or not. Signs were also used at all entrances to communicate to the crowd that the pen was closed. Both of these tasks were often supervised by the deputy CM. Because the entrances to the pens were at the side of the pens the pressure against the front of stage barrier could get quite uneven at times, which makes the risk of crowd surges higher. To counteract this volunteers with signs saying "Better spots further in" was used. On stage 2 this was quite a large problem during the first days, creating a huge crowd pressure on one side of the stage, while the other was only half full. This stemmed from stage 2 only having one entrance to the crowd pen, located on one side of the stage. Because of the trouble this brought another entrance was built on later days and a lot of volunteers with cordon-tape also created a corridor from the most heavily used entrance to the middle backside of the pen, so that visitors got more evenly distributed. The change was proposed and supervised by the CMs.

In the work with crowd pens several resilience strategies can be found. First of all the actual management of the density and pressure in the pens can be considered a resilience
strategy. How the opening and closing of the crowd pens worked was another resilience strategy and so was the balancing of the audience within the pens. Finally, monitoring the functioning within the pen at stage 2 and changing the strategy to create a more evenly distributed pressure can be seen as a resilience strategy in itself. These strategies are discussed further in Resilience strategies.

3.1.4 Entrances. There were three entrances to the festival area, lets call them north, middle and south. The north and middle entrances were the entrances closest to the camp-site and therefore had the highest amount of people passing through. There were several camp-sites with separate entrances, but the main camp-site and its entrance was by far the largest. When arriving at the festival each visitor turned their ticket in for a festival bracelet that could not be removed without permanently destroying it, a process that took place close to, but not at, the actual entrances. At each entrance a couple of steps then took place before letting someone in. First of all a volunteer checked so that the visitor had a bracelet on, meaning they had access to the festival (or camp-site) area. Then another volunteer searched the visitor for alcohol, weapons and other items not allowed into the area. Finally, any bags that the visitor brought was searched by a third volunteer. Each entrance had several cues, the largest one as many as 20, but only a certain number was being used at a given time. During periods of low activity, only a few entrances were open, while more opened up when more visitors was arriving. The entrances did not have enough safety personnel to be able to open all cues by themselves, instead safety troubleshooters were called in during times of high activity to support the entrance. Besides opening more cues the rate of admission was also sped up by doing a more shallow search of visitors when the cues outside was building to dangerous levels. The idea at an entrance of this kind is to try to keep the rate of admission equally high to the number of arriving visitors, so that cues never have the chance to form. When the rate of admission is lower than the number of arriving visitors, cues starts building up and continue to do so until the rate of admission can be sped up, or the number of arriving visitors lessens. When cues get long enough, the crowd density can increase and build up a pressure at the front, not unlike the pressure that builds up during a concert, potentially creating a dangerous situation.

Adjusting the rate of admission by opening more cues or lowering the thoroughness when searching visitors can be done either proactively or reactively. If done reactively, there is a lag between when more visitors starts arriving and when new cues can be opened, especially because more personnel needs to be requested which need time to get to the entrance. During this lag cues will build up outside the entrance and may potentially become a problem. At the festival in question adjustment was instead often proactive. To be able to adjust the rate of admission proactively, several things were done. First of all, times when a lot of visitors usually arrived (such as during early evening, before large concerts et.c.) were identified and during these times more cues were open from the start. The number of people leaving the camp-site entrance heading for the festival, or vice versa, was regularly reported via radio which gave entrances time to prepare. The CMs were the receivers of this information, keeping track of where people were at the time and relaying relevant information to the entrances. Because the camp-site entrance always had the most to do when the festival area closed, the SM there got a report from the CM when the last song was playing on the big stages. Because monitoring was taking place, giving entrances time to respond accordingly prior to more visitors arriving, resources, especially in the form
of personnel, could be used effectively. This also meant that personnel at the entrances could get some rest during times of low activity, confident that they had time to respond before the activity got high again.

The proactive adjustment of the rate of admission at entrances is an example of a resilience strategy for how the safety organization adjusted to crowds, which will be explored further in the sections Adjusting to crowds and Resilience strategies.

3.1.5 Adjusting to crowds. During the festival, the safety organization adjusted itself to crowds constantly, in different ways. Detailed above are the most important ways that were found, including CMRs to handle stages that could get full, managing crowd pit density and balancing and making sure the cues at the entrances were manageable. It was also clear during the festival that the organization monitored its own work with crowds, both in the form of routines and permanent structures such as fencing and front of stage barriers. When found to work poorly or when there was room for improvement, changes were made and implemented when time allowed.

Looking closer at these activities, it becomes clear that there were two main occasions when the safety organization adjusted itself to crowds:

1. When there was a risk of crowd density and pressure building up
2. When established structures or routines for handling crowds were found not to work or have room for improvement

There were both expected and unexpected conditions leading up to these adjustments. When a condition was expected during the festival it had to do with one of two things. Either the condition had been foreseen in the risk analysis, or it was expected because monitoring of crowd conditions gave enough warning to respond prior to an event. Unexpected conditions in contrast happened when there was a discrepancy between the risk analysis and the reality, or when monitoring failed to pick up indicators of the condition. When established structures or routines failed it can also be seen as an unexpected condition.

While there was indeed a multitude of tasks and events related to crowds it is possible to generalize and draw some conclusions about how the safety organization acted in relation to crowds. There were mainly three types of general actions involved, namely:

1. Resource allocation - For example deploying more personnel to an entrance, or making sure that there were enough personnel to handle a CMR
2. Restricting access to areas - For example by a soft or hard closedown, sealing off a stage that was about to get overcrowded, closing the entrance to a crowd pen, in conjunction with this cues were often created for orderly management of the crowd outside of the area
3. Giving information - For example in conjunction with a closedown informing the crowd by signs or verbally that the area was full, or that there were better spots further in at a crowd pen

There were of course other times and other ways in which the safety organization adjusted itself and responded to crowds, but these were found to be the most important and relevant by far. While this is a generalization, it comes quite far in describing the different
tasks and work that different actors were involved in within the safety organization. In the next section, specific resilience strategies will be described.

3.1.6 Resilience strategies. During the festival, many resilience strategies relating to crowds were observed. The eight strategies deemed to be most important were: Crowd management routines, High crowd density in cue, Crowd pen density, Crowd pen opening and closing, Crowd pen balancing, Entrances, Monitoring for efficient resource allocation and Adjusting routines. In this section all eight strategies will be analysed in the framework proposed by Rankin et al. (2011). The strategy High crowd density in cue was an improvised one and its analysis is based on that specific event. All the other strategies are abstracted from multiple observations throughout the festival.

CMRs are resilience strategies for making sure that the crowd density and pressure does not exceed dangerous levels in different areas and can be seen in Figure 6. When an area’s attraction is higher than its capacity, crowd density might reach dangerous levels resulting in injuries. The strategy is specified at the blunt end and adopted to the specific situation by the sharp end and entails monitoring the area and routes leading there as well as which concerts and happenings might get overcrowded. When situations that might potentially get dangerous left to themselves are identified, the safety organization responds by using personnel and signs to establish a cue and gradually close down the area while informing the crowd, thereby making sure the crowd pressure does not escalate to unwanted levels.

In one observed event at Stage 7 described earlier, the area’s attraction was so high that crowd density and pressure rose to unwanted levels in the cue itself, outside of the area. In this particular case an improvised strategy was implemented and it can be seen in Figure 7. The crowd pressure rose to unwanted levels partly because people had the possibility to skip ahead in line and the response was to encapsulate the crowd with personnel, making sure no more people could skip ahead, while informing the crowd. Further, the inflow of people was kept at very low levels, to avoid rushes and surges when letting more people into the venue.

Work concerning the crowd pens can be described as three separate, but intercon-
Prerequisites

Forces & Conditions
- Perceived risk of not getting in. Possibility to skip ahead in line - failed or late CMR.

Unwanted Outcome
- A high crowd density leading to a dangerous pressure, resulting in possible injuries.

Resources & Enabling Conditions
- Personnel, signs (bikeracks, cordon tape, megafon).

Actions

Monitoring
- Monitoring of cue buildup because of CMRs.

Responding
- Encapsulating the cue, taking away the possibility of more people skipping ahead.
- Information verbally and through signs.
- Controlled and slow inflow of visitors to avoid rushes and crowd surges.

Blunt/Sharp end-interactions
- Sharp end improvisation based on existing CMR.

Figure 7. Resilience Strategy: High crowd density in cue

Connected strategies. Crowd pens are built to alleviate pressure at the front of stage barrier. At large stages this is required so that the pressure does not rise to dangerous levels in the crowd which happens because the audience wants to be close to the stage and the artist. Regulating the pressure in the crowd pens can be seen in Figure 8 and consisted of monitoring the pressure, crowd density and various other factors and open or close the crowd pen entrances accordingly.

Opening and closing crowd pens can in itself be risky. Because many in the audience wants to be close to the stage and thereby want to get inside the crowd pens, the crowd density outside of the entrances to the pens can build to dangerous levels and it can also lead to rushes when the crowd pen entrances open. To manage these risks the entrances to the crowd pens were built in a way so that the audience that was cueing to get into the crowd pen could not see the stage at the same time, thereby making them choose between cueing and watching the concert. The strategy itself can be seen in Figure 9 and consisted of monitoring the situation outside of the crowd pen as well as the density in the crowd pen. Responding consisted of opening or closing the entrances as well as informing the audience that the pens were open or closed correspondingly. In the case of the most heavily exposed entrance an extra fence was built with sight line-killers so that the audience could not even see the entrance when it was closed. This fence was then removed when the entrance opened again.

The crowd pen entrances are usually built to the sides of the stage, since placing them centred would mean a very high pressure against them. Placing them off to the side creates a new problem. Many in the audience wants to get close to the stage and therefore pick the straightest path forward, leading to an unbalanced pressure in the pens. This unbalanced pressure leads to increased crowd surges parallel to the stage which in turn leads to people tripping and possibly falling which can result in injuries. To counteract this the safety organization monitored which concerts were so popular that measures would need to be taken, as well as the crowd density in the pens. When needed personnel with signs and cordon tape was employed saying "Better spots further in", redirecting people further into the back of the pen. This strategy lead to the pressure being more balanced and can be seen in Figure 10.

During each day of a music festival each visitor arrives through the entrance and
### Resilience Strategies in Crowd Management

#### Prerequisites

**Forces & Conditions**
- Visitors want to be close to the stage.
- Crowd density builds up in pens, pressure builds up at front of stage barriers.

**Unwanted Outcome**
- A high crowd density leading to a dangerous pressure, resulting in possible injuries or even death.

**Resources & Enabling Conditions**
- Crowd pens that can be opened and closed.
- Personnel, signs.

#### Actions

<table>
<thead>
<tr>
<th>Monitoring</th>
<th>Monitoring of pressure at front of stage barriers. Monitoring of crowd density in crowd pens. Monitoring of specific risks linked to the performance.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responding</td>
<td>Closing and opening the crowd pen.</td>
</tr>
<tr>
<td>Blunt/Sharp end-interactions</td>
<td>Routine developed mainly on the sharp end.</td>
</tr>
</tbody>
</table>

*Figure 8*. Resilience Strategy: Crowd pen density

#### Prerequisites

**Forces & Conditions**
- Visitors want to be close to the stage and cue outside of the crowd pen when closed.

**Unwanted Outcome**
- A high crowd density at the entrance to the crowd pen. Rushes to get in, uncontrolled inflow of people leading to a high crowd density in the crowd pit. Possible injuries.

**Resources & Enabling Conditions**
- Well built entrance with sight line-blockers so that audience cueing to get in can not see the stage. Signs, personnel, fences.

#### Actions

<table>
<thead>
<tr>
<th>Monitoring</th>
<th>Monitoring of the situation outside of the crowd pen. Monitoring of crowd pen density, see corresponding strategy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responding</td>
<td>Personnel builds fences with sight line-blockers so that audience can not see the entrances. Personnel with signs are posted outside.</td>
</tr>
<tr>
<td>Blunt/Sharp end-interactions</td>
<td>Routine developed mainly on the sharp end.</td>
</tr>
</tbody>
</table>

*Figure 9*. Resilience Strategy: Crowd pen opening and closing

#### Prerequisites

**Forces & Conditions**
- Entrance to the crowd pit is located at the sides, audience takes the straightest route to get close to the stage.

**Unwanted Outcome**
- Uneven density in the crowd leading to crowd surges and people in the crowd falling, resulting in possible injuries.

**Resources & Enabling Conditions**
- Personnel, signs, cordon tape.

#### Actions

<table>
<thead>
<tr>
<th>Monitoring</th>
<th>Monitoring of which concerts are so popular that measures needs to be taken. Monitoring of the crowd density in the pen.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responding</td>
<td>Signs and personnel, possibly with cordon tape, saying 'Better spots further in' to redirect people to the back of the pen.</td>
</tr>
<tr>
<td>Blunt/Sharp end-interactions</td>
<td>Routine developed mainly on the sharp end.</td>
</tr>
</tbody>
</table>

*Figure 10*. Resilience Strategy: Crowd pen balancing
then leaves at least once, but most often several times during the day. The rate of arriving
visitors is variable and if it becomes higher then the rate of admission cues starts to form.
When the cue builds up over time the crowd density increases which can eventually result in
injuries and discomfort. To handle this the safety organization monitored the cues outside of
the entrances as well as the routes leading to the entrances, so that they could proactively
respond by opening more entrances and by lowering the thoroughness of search. This
strategy can be described as seen in Figure 11.

The strategy described in Figure 12 has not previously been discussed in detail and
it does not relate exclusively to crowd management. Despite this it is still highly relevant
for describing the safety organization’s work with crowds and it is therefore included as
a resilience strategy. Because a music festival is highly dynamic, with crowd movement
and events happening all over, all the time, the demand on the safety organization is highly
variable as well. During this years festival this was further enhanced by recruiting problems,
there were not as many volunteers recruited as was planned for. This created the risk of
not having enough personnel available at specific locations to handle crowd events, which
could lead to deteriorating situations and injuries. However, exactly because a festival is
dynamic it was possible to move personnel resources between the areas that needed them
at the moment. This was done long term by reassigning personnel to areas that needed
them, or short term by employing groups of safety troubleshooters which was a part of
the organization specifically designed to be used as a short term buffer to handle specific
events. The safety organization accomplished this by anticipating where personnel would
be needed long-term, monitoring the overall crowd situation and personnel placement and
needs and then by reallocating personnel long-term or short-term. In practice the long-term
reallocations of personnel usually took place during the SM-meeting held each day and short
term reallocation of troubleshooter resources was handled by the troubleshooter SM.

There were several examples during the festival of routines that worked sub-optimally
or even outright badly. During most of these times the routine was discussed after the event
that triggered it and was then updated for the better. If the routine had not been changed,
it would have continued to work sub-optimally and therefore there would be a heightened
risk of the routine failing and creating injuries. Changing a routine in the middle of the
festival required monitoring of the organisation’s routines and tasks so a suboptimal routine
was actually identified, it required time to adjust and implement a new routine but correct
Prerequisites

Forces & Conditions
Problems with recruiting volunteers, not having the desired amount of personnel. Variable attraction of concerts, variable crowd movement and behaviour.

Unwanted Outcome
Not having the resources available at specific locations to handle crowd events, leading to deteriorating situations and possible injuries.

Resources & Enabling Conditions
Personnel, low activity in some areas when personnel is needed in others.

Actions

Anticipating
Anticipation of where resources will be needed long-term.

Monitoring
Monitoring of overall crowd situation. Monitoring of personnel placement and needs.

Responding
Reallocation of personnel, long-term or short-term.

Blunt/Sharp end-interactions
Blunt end management for sharp end needs.

Figure 12. Resilience Strategy: Monitoring for efficient resource allocation

Prerequisites

Forces & Conditions
Routine or task did not go as planned or has room for improvement.

Unwanted Outcome
Suboptimal routine being used during the festival, resulting in other unwanted outcomes.

Resources & Enabling Conditions
Time to adjust and implement new routine.

Actions

Monitoring
Monitoring of the organizations routines and tasks.

Responding
Developing the routine, implementing change.

Learning
Learning what went wrong or had the possibility for improvement.

Blunt/Sharp end-interactions
Sharp end execution triggers blunt end change, that gets implemented by the sharp end.

Figure 13. Resilience Strategy: Adjusting routines

learning was also needed so that the change was actually for the better. In the case of some routines, such as the crowd pen balancing on stage 2, this process happened several times during the first days, improving the routine and the structure around it each time until it worked as intended. The strategy of adjusting routines can be described as seen in Figure 13.

While there were undoubtedly other routines and strategies involved in managing crowds at the festival, and while there are indeed a multitude of ways to describe these routines and strategies the resilience strategies presented here should give a good oversight of the work of managing crowds at the music festival in question. While the safety organization would probably describe its work in other ways, describing the strategies in the framework proposed by Rankin et al. (2011) should hopefully make comparisons with other domains possible and ease the comprehension of crowd management work for someone who is not familiar with the domains of event safety and crowd management.
3.2 Social Identity and Crowd Conflict

This section of the results will start off by exploring the Festival visitors and their identity and also explore Change in social identity at the festival. The second part will focus on the Categorizing, Organizing and Mutual Treatment that went on between the festival visitors and the safety organization.

3.2.1 Festival visitors and their identity. There are many clues as to the identification of festival visitors in the interviews and observations at the festival. This section explores how the respondents talked about themselves and how they described others. This is then used alongside observations at the festival to sketch a picture of the festival visitors, their identity and in what situations a possible change in social identity happened. First of all some background information from the interviews will be presented.

As previously mentioned in the method, there were 84 respondents in the interviews of which 48 were female and 36 were male, the mean age was 25.5 years (SD = 10.8). The respondents had been to a mean of 6.3 festivals before this one (SD = 8.5) and had visited the festival in question on average 2.2 times before this year (SD = 2.2). 33 of the respondents lived at home and 30 lived at one of the festival camp-sites while the other 21 stayed at a friends or relatives place, in a rented apartment or cabin or other such places. While there were some visitors that lived with people they did not know before the festival, most arrived at the festival and lived with others they knew beforehand, regardless of how they lived.

The festival visitors were quite diverse. Not only did they vary in age, experience and living arrangements, but their reasons for being at the festival, their clothing, their favourite bands, their descriptions of themselves and whether they did things at the festival they usually did not and many other things varied widely as well. When describing others, and in other parts of the interviews, this diversity shone through. While many of the respondents described other visitors in terms of age, what music genre they listened to, whether or not they were there to party or to listen to music et.c., many described them in differentiating terms. Differentiating terms are here meant to include statements that emphasis the individuality of people, statements that there is a general "mix" of people and statements saying that there are "all kinds of people" at the festival. One respondent said "It's a very mixed crowd since the music is so mixed", another said "There are all kinds of people here, older, younger, a total mix of everything you can imagine" and throughout the interviews these kinds of statements were quite common.

When observing the festival, this diversity was very clear. While many visitors were quite young, there was a large diversity in age and all age groups, from very young children to senior citizens, were present. The clothing styles of visitors also ranged from ordinary to extreme and covered all possible styles, both related to specific music genres and not. While it is outside the scope of the study, mainly two things can probably explain the diversity of people at this specific music festival. First of all the fact that the festival took place inside of a city meant that it was easily accessible for all citizens, including families and senior citizens. When music festivals take place outside of a city, on a large field as is often the case, it is harder to get to from home and is also often harder to navigate since there are often no paved streets. Secondly, the artists performing represented all kinds of different musical genres, meaning that most people should have been able to find something they
liked.

One of the questions in the interview was designed to try to probe the respondent for their feeling of identity. The question was phrased *‘If a local newspaper about the festival interviewed you with a question in a short-column like this [show newspaper-column], what would you then like it to say under your name?’*. The answers were coded into categories and can be seen in Table 7. This was perceived as a quite difficult question, seemingly both to understand and to find a good answer to, and many took quite some time to think. As many as 18 people did not answer the question at all or simply answered "I don't know" after some thinking. Among the others, the answers were most often indicative of describing a personal identity rather than a social one.

Table 7

<table>
<thead>
<tr>
<th>#</th>
<th>Category</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Description of person</td>
<td>'The man', 'Intense', 'Spontaneous music-lover, enjoying life'</td>
</tr>
<tr>
<td>15</td>
<td>Occupation</td>
<td>'Student', 'Translator'</td>
</tr>
<tr>
<td>10</td>
<td>Role at the festival</td>
<td>'Volunteer', 'Festival-visitor'</td>
</tr>
<tr>
<td>7</td>
<td>Opinion/preference</td>
<td>'Vegan', 'My favourite band'</td>
</tr>
<tr>
<td>6</td>
<td>Hometown</td>
<td>'Living in xx', 'From xx'</td>
</tr>
<tr>
<td>5</td>
<td>Feeling</td>
<td>'Happy chick', 'Overwhelmed'</td>
</tr>
<tr>
<td>18</td>
<td>Unanswered</td>
<td>'I don’t know'</td>
</tr>
</tbody>
</table>

So what social identities were salient among the visitors? Looking at the data collected it seems that all kinds of social identities were salient among the visitors. While many undoubtedly found new friends at the festival, the interviews points to the fact that most of them lived, and visited the festival, with people they knew from before. Perhaps this question is best answered by a quote from one of the respondents describing other festival visitors: "All the different categories that exist in society also exists at the festival!".

While no superordinate 'festival-identity' seemed to exist, it is worth noting that the visitors described each other and the atmosphere at the festival in very positive ways. Without being explicitly asked about a positive or negative evaluation of other visitors, 51 of the respondents used positive words to describe others and only 3 used negative words. Asking about the atmosphere at the festival yielded 83 positive responses and only 1 negative response saying "It was chaotic the first few days". Many of the responses were quite strongly positive such as "It’s really good, there is an amazing atmosphere despite being such a large festival" and when asked about why they were visiting the festival in the first place, the atmosphere was only second to the music as the reason stated.

3.2.1.1 Change in social identity. According to Turner and Oakes (1994) social identity refers to how we understand ourselves as a member of a social category as contrasted to other social categories. Because of the processes of comparative and normative fit, this mean in extension that even while our in-group stays the same, our social identity may change because of a change in the out-group and the people surrounding us. In the case of a music festival, this suggests that a group of friends going to the festival together might experience a shift in social identity when arriving because of a shift in the
social context as compared to their usual one\textsuperscript{7}. While the potential shift in social identity when arriving at the festival is indeed an interesting one, it is outside the scope of this thesis which focuses on potential shifts in social identity linked to the interaction between visitors and the safety organization. That being said, the fact that so many differentiating remarks about the categorization of others were made during the interviews leads to the conclusion that while music genres and age might be comparative and normative factors in categorizing others, and therefore in extension the own group, this effect does not seem to be a large one. This is coherent with the conclusion that all kinds of social identities that are present in society were also present at the festival, there was no evidence to suggest larger overarching social identities, at least not strong enough to outweigh the localized ones.

While shifts in social identity were never directly observable, there were several examples of collective behaviour, observed both by the author and the assistants. Cheering songs were very common throughout the festival. These were often started by a small group of people, or even a single individual, and were then often picked up by others nearby. This often happened later in the day or evening and one often got the feeling that the participants were in the younger segment of festival visitors and also often seemed intoxicated. There were a few different well known Swedish cheering songs that were recurring during the festival, both in the form of everyone singing at the same time, and in the form of two groups where the first group started singing, the second answered and so forth\textsuperscript{8}. It could be argued that these cheering songs could lead to a temporary shift in social identity towards "We who are cheering" or even "We that belong to the first cheering-group", but these shifts were in that case highly temporary and no lasting effects were seen. When the cheering died out people continued socializing with their original group and scattered in different directions. Another form of collective behaviour is common at all live concerts, namely the waving, clapping and dancing that occurs in live audiences. This behaviour was observed at almost all live concerts at the festival, but are also outside the scope of the study and temporary in nature. The next section will offer a closer look at CMRs, mainly from the view of the Aggravation and Mitigation Model.

3.2.2 Categorizing, Organizing and Mutual Treatment. During the festival there were endless examples of categorizing, organizing and mutual treatment going on between the safety organization and the visitors. These examples range from documents collected during the planning of the festival, to video recordings and field notes during tense situations. In the following section these factors will be presented and analysed one by one. While the focus is on the use of CMRs, various examples from other areas of the festival will be presented as well.

3.2.2.1 Categorizing. As a factor in crowd conflict categorizing can be either aggravating or mitigating depending on how the involved view those in the other group. If the view is a negative stereotypic one it is an aggravating process, and if positive categorizing and differentiation is high and the actions of one person are not seen as representative for

\textsuperscript{7}While it is only speculation on the author’s part, one might argue that this shift is potentially larger for those that travel to the festival and live together at the camp-site. In contrast with those that live in the same city as the festival, the camping-visitors never really leave the social context of the festival.

\textsuperscript{8}These cheering songs are very hard to translate since they are uniquely localised to Sweden. However, one specific chant was the melody for the popular White Stripes song "Seven Nation Army", that in my personal experience is chanted outside of Sweden as well.
the whole group, it is an mitigating process (Hylander & Granström, 2010; Rosander & Guva, 2012). To provide an easily accessible background for how the visitors seemed to view the safety organization some data from the interviews will be used. Two questions asked about the visitors impression about the safety staff and the deputized security and the answers categorized by positive, neutral and negative remarks can be seen in Table 8 and Table 9 respectively. There are a few things to note in these results. First of all positive remarks were abundant and while negative remarks were few, they were often quite strongly worded. It should also be noted that many of the neutral remarks about deputized security stemmed from not having been in contact with them at the festival. While differentiating remarks were not as many as when describing other visitors they were still common in the answers to these questions as well. Many of the neutral remarks were differentiating, saying they had both good and bad impressions, and many of the negative impressions concerned specific groups of safety personnel, such as those working at the entrances. While these negative remarks were not differentiating on the individual level, they differentiate in the way that the whole safety organization was not seen as a homogeneous group, but rather as consisting of many different parts.

Table 8

<table>
<thead>
<tr>
<th>#</th>
<th>Category</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>58</td>
<td>Positive</td>
<td>&quot;They are good, good treatment, they deserve praise”, &quot;Really nice and helpful&quot;</td>
</tr>
<tr>
<td>13</td>
<td>Neutral</td>
<td>&quot;Mixed&quot;, 'Good and bad, there are those who volunteer just to get into the festival area and then don’t give a damn and then there are those who do what they should.&quot;</td>
</tr>
<tr>
<td>12</td>
<td>Negative</td>
<td>&quot;Most don’t know what they are doing&quot;, &quot;Not good, they are haughty against you, like they know better&quot;</td>
</tr>
</tbody>
</table>

Table 9

<table>
<thead>
<tr>
<th>#</th>
<th>Category</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>Positive</td>
<td>&quot;Good, professional”, ‘They are nice, they are doing their job’, &quot;They are helpful&quot;</td>
</tr>
<tr>
<td>30</td>
<td>Neutral</td>
<td>'I haven’t seen much of them, so I can’t say’, &quot;They seem tough&quot;</td>
</tr>
<tr>
<td>7</td>
<td>Negative</td>
<td>'I didn’t get to bring food outside at first, I don’t like the ones that are a bit macho”, &quot;Some are good but some only seem to want to remove people that has found a nice place to sit, they seem to want to show themselves superior&quot;</td>
</tr>
</tbody>
</table>

In the planning for the festival some categorization of visitors took place. This mainly

9 Despite these often strongly worded negative impressions, the head of deputized security noted to me on the Sunday after the festival that not a single official complaint against any deputized security guard had been made during the festival up until that point. This is quite noteworthy at such a large festival with many deputized security guards doing lots of interventions each day.

10 Note however that these questions were worded differently.
happened in one of the parts of the risk analysis for performances, trying to pinpoint what sort of crowd was expected to attend the performance. This categorization was based mainly on the expected age of the visitors and the music genre of the artist. Age-wise the idea seemed to be that a young crowd implied more crowd movement and dancing, whilst having a lower experience with concerts and possibly a weaker stature, leading to a higher risk. The music genre of the artist also mattered in this categorization, since for example a heavy metal performance differs widely from a dance-friendly electronic performance, or jazz. This categorization was specific for the risk analysis and seemed not to carry over to other parts of the planning process. There was no evidence that these categorizations were negative in character or that one type of crowd was preferred over another.

When it comes to the CMRs there were a few interesting observations considering the categorization of both safety staff and visitors. Looking back at the examples of how CMRs could evolve in Sections 3.1.2.1 and 3.1.2.2 there seems to be multiple things to consider. First of all, the CMRs are inherently categorizing in nature, since they are designed to treat a large group of people the same way by restricting their access to a stage. This is not completely unlike how the police sometimes restricts access to certain areas or routes when dealing with demonstrators or hooligans, an area where crowd conflict has been studied many times (e.g. Drury & Reicher, 1999; Schreiber & Adang, 2010; Stott & Reicher, 1998). One should of course note that while the tasks are similar, the context and involved parties are completely different.

While the CMRs were categorizing in nature, there was a high degree of differentiation when looking at the behaviour of both the safety organization and the visitors. When individual visitors broke rules or acted badly, such as trying to jump the fence to get ahead in line or pushing and shoving, they were talked to as individuals and in in some cases where talking did not help, deputized security used minimum force to remove them from the scene. Interventions from deputized security always seemed to be quite discreet and one of the quotes from the head of deputized security mentioned earlier points to that this was a thought-through strategy: ’It is time to keep a damn low profile. Be nice and think about what you say.’ No forceful acts where groups of deputized security acted upon the crowd of visitors were seen but instead all interventions were performed by only one or two deputized security. The strategy when informing visitors of the situation was to both use signs and megaphones to reach the whole crowd, and to go around and talk to individual members of the crowd verbally. One observation that suggests that visitors also differentiated between the safety staff is that several visitors were seen going around talking to safety volunteers, SMs and deputized security to get information about the situation, and more importantly, try to talk their way into the stage. There were also quite a few angry outbursts observed in conjunction with visitors not getting into a performance they wanted to see, but these outbursts were always directed at the "festival" as some kind of abstract entity, not the safety organization or individual members thereof. It seemed as if the visitors were frustrated by the fact that the artist in question was playing on a small stage resulting in that everyone could not attend the performance. At the same time it seemed as if they understood that this was not the fault of the individual volunteers or staff members who performed the job of denying them entrance to the stage.

While the task of closing off a stage to the visitors is inherently categorizing in nature, differentiation was high both among the safety organization and the visitors. In conjunction
with the largely positive categorization of the safety organization by the visitors implicated in the visitor interviews this leads to the conclusion that the categorization process was a mitigating one.

### 3.2.2.2 Organizing

An aggravating process linked to organizing is anything that involved parties does to contribute to confusion and the creating of chaos, such as sudden inexplicable actions or lack of information. As a mitigating process it is anything that contributes to avoiding uncertainty, such as clear rules and information (Hylander & Granström, 2010; Rosander & Guva, 2012). Accurate and easily accessible information and clear rules are of course vital to the realization of a large music festival and there are endless examples of this in all parts of the data. This includes everything from information on the web before the festival to signs, maps, dynamic information on large video screens, verbal information from the staff, lists of rules detailing for example what can be brought into the festival area and not, information through loudspeakers and much, much more. This could easily be the subject of a study in itself, or indeed multiple studies, so the subject of organizing will henceforth be delimited to organization in the execution of CMRs. Do note however that the festival did have clear rules and information throughout, something that may affect the initial values of the visitors involved in a CMR-situation in a positive way.

When looking at the CMRs it is clear that the safety organization understood the importance of information. Signs, megaphones and verbal information was not only used during the execution of CMRs, but were actually a large part of the planning for CMRs. Information was scripted and prepared in advance and included informing the visitors what was happening at all times and also what was expected of them. Not only was the information itself planned in advance, but also who was responsible for giving it and what material was needed. As can be seen multiple times in the event described in Section 3.1.2.1, information also had a large role in handling a situation that was getting out of hand. Organizing as a mitigating process does not only consist of information however, but includes everything that contributes to avoiding uncertainty in the situation. Structures such as fenced-off areas for cueing was one positive factor in avoiding uncertainty. Another was the fact that all safety volunteers had green reflective vests, saying "Safety", while all SMs who had leadership-roles had red reflective vests saying "Safety manager". Clearly identifiable leadership is one of the things identified as a mitigating factor in the organizing process according to Hylander and Granström (2010).

The visitors however seemed to contribute to confusing the situation and creating chaos. This was seen in many situations where visitors would try to sneak ahead in the cue, sometimes jumping fences or going under cordon-tape to do so. The noise level was often fairly high and chanting songs were common when cueing, creating an environment where it was hard to communicate properly. No clear leadership existed and visitors seldom had clear information to present to the safety organization. That being said, the majority of visitors did not skip ahead in line or otherwise behave in ways not seen as appropriate or as breaking social conventions or festival rules. During all the observations of CMRs there was never any intention observed for creating chaos or confusion on the visitors behalf, it was only that individual actions could be seen as adding to the confusion of already confusing and slightly chaotic situations. Judging from the high differentiation by the safety organization as well as other observations, the safety organization indeed did not seem to ascribe any
intentionality to create confusion behind these actions. Instead they were seen as isolated behaviour from isolated individuals, or small groups of individuals.

The safety organization offered clear information and organizing structures in regard to the CMRs and while visitors did not, neither did they intentionally contribute to creating confusion or chaos. All in all, the organizing process seemed to be a highly mitigating one mainly attributable to the safety organization’s focus to get information out to the visitors, as can be seen both in the planning process and the execution of actual CMRs at the festival.

3.2.2.3 Mutual Treatment. Provocation and letting oneself be provoked are both examples of aggravating processes linked to mutual treatment while disarming, not letting oneself be provoked and friendly interaction are mitigating processes. Many observations were made during the festival linked to friendly interaction between the safety organization and the visitors, ranging from friendly greetings offered by the safety volunteers when visitors entered the festival area, to answering questions and even when safety personnel or deputized security had to reprimand visitors that broke rules, this was done in a friendly way\textsuperscript{11}. An example from the festival follows, taking place Thursday right before midnight:

Out strolling the festival area I come across three men taking a bath in a fountain, wearing only their underwear. This is at a quite central place of the festival, although at the moment there are not that many visitors around and those that do are not stop but instead keeps walking by. The men are in their middle twenties and are quite loud and obviously intoxicated. I observe from a distance and when two deputized security guards just happening by walks up to them I discreetly close the distance to be able to hear the conversation. One of the guards says: "Hi, could you please step out of the fountain?" and makes a motion with his arm to indicate them stepping out. The men in the fountain splashes around a little bit more and asks why, whereby the guard laughs and says: "Could you please step out so we can talk properly, out of the water?". The men gets out of the fountain under some protest, but laughs and jokes around with the guards while doing so, explaining they were just fooling around and feeling hot. When they get out both guards are smiling and laughing with them, but at the same time the guard doing the talking firmly says: "Please put your clothes on, you obviously aren’t allowed to take a bath in the fountain, in the middle of the festival area." whereby the men starts dressing. Meanwhile two more deputized security guards walks by and misjudges the situation somewhat, quickly stepping in to their partners sides, looking a little grim. Only seconds after they realize that the men are dressing and that the mood is a good one, so as quickly as they stepped in they step out again. They recognize me from the day before when we had a chat so we start talking. Soon thereafter the men are dressed and they apologize and shake hands with the guards before they part and walks separate ways.

\textsuperscript{11}This of course depended on what the visitor had done, but even when serious transgressions were observed, the initial tone of the conversation was almost always friendly, even in situations that later escalated and became unpleasant.
Throughout the festival situations like these were observed both by me and by the assistants and in most cases the tone and mood was a pleasant and friendly one. The situations most often stemmed from people drinking alcohol they had smuggled into the area (which was not allowed, so they had to pour it out) or visitors climbing trees, containers, lamp-poles and other visitors (that is, sitting on their shoulders) to get a better view of a concert. Very few situations led to anything other then a verbal reprimand and visitors were often apologetic.

The execution of CMRs were no different in this regard. Visitors breaking rules were reprimanded, but in a nice tone. In these situations there were some provocation from individual visitors in the form of outward-acting aggressive behaviour, but unless this was directed at a specific person or threatening in nature, personnel in the safety organization and deputized security did not act upon it, thereby not letting themselves be provoked. While visitors could be quite agitated that they did not get to attend the concert they wanted to attend, their tone when talking to personnel about it was more often then not polite.

Friendly interaction between the safety organization and visitors was very common and provoking behaviour was not. The process of mutual treatment was definitely a mitigating one.

### 3.3 Linking it all together

To pull this all together one last story from the festival will be presented below. The story evolved during several days of the festival and beside being a story touching on social identity and showcasing different AM model-processes at work, it is also a story about how the Resilience Strategy *Crowd Pen Balancing at Stage 2* evolved throughout the days. The relation between Resilience Strategies, social identity and the AM-model will be explored further in the discussion.

Stage 2 was built in a way that it had a single crowd pen with an entrance and exit stage left. During the planning of the festival an entrance at stage right was discussed, but because the layout of the stage was a little problematic it was eventually agreed that there was a risk of crowd pressure against an entrance on stage right and therefore it was not built. Since there was only one entrance located to one of the sides there was a worry that the pen would get unbalanced with a higher crowd pressure on stage left and because of this there was a plan to use safety personnel to lead visitors further into the pen. The stage had its first concerts during Wednesday and it turned out that while this plan had an effect, the stage was still very unbalanced. Later I heard from one of the safety stage managers that while they were lifting lots and lots of people over the stage barrier at stage left because of the crowd pressure, people were sitting on the ground having a picnic on stage right. It was decided that an entrance stage right was going to be built next day, a solution was drawn up to avoid crowd pressure problems and the entrance was in place before the festival opened Thursday. However, the entrance stage right was not as attractive as the entrance stage left since it was a bit out of the way and people would not know it existed since it was newly built. Therefore the plan to balance the crowd pen was enhanced
as well with more safety personnel directing people further back and to the side of the pen.

Late Thursday afternoon I was standing with the first deputy crowd manager in the front of house-tower at Stage 2, watching people arrive for a concert that was about to start. About 15 safety volunteers were standing in a loose line, directing people towards the back of the pen, also holding a large sign saying 'Better spots further in'. They reached about half the way back towards the back center of the pen. While most of the visitors followed the directions of the safety personnel, there were also many that did not and instead walked right through the line even though the safety personnel were holding their arms out wide to try to stop them. The stage was not at all full during this concert and even though it was not perfect the crowd balance was quite good.

Both Friday and Saturday I revisited the front of house-tower at the stage. During concerts where the stage was expected to get full, many more volunteers were used. At the peak as many as 40 volunteers were used, reaching all the way to the back center of the stage. During Friday some of these volunteers started dancing while directing people further back. First this was isolated to a few volunteers standing next to each other but over time it grew. Finally many of the volunteers were dancing and pointing further ahead. This eventually evolved to volunteers dancing and high-fiveing the visitors that were walking or running past them to get further in. At this point none of the visitors were walking through the line, but instead everyone was following the directions of the volunteers, sometimes dancing along, seemingly inspired by the volunteers. After having observed this behaviour twice I got the distinct feeling that the visitors were more inclined to follow the cordon of volunteers to the backside of the pen because their behaviour was signalling something different. It was my belief that while they were earlier signalling a blockade, they were now signalling that they were trying to guide the way. The combination of all these events lead to the stage being almost perfectly balanced from that point on. The behaviour where safety personnel danced and pointed when showing the way was also observed at other parts of the festival, both by me and the assistants.

Described in the theoretical frameworks used previously this story really highlights how the different strategies and social processes relate. In an effort to best manage the Crowd pen density, the worries about Crowd pen opening/closing affected Crowd pen balancing since only one crowd pen entrance was used. This lead to Adjusting routines to best cater the need for these routines. This also involved Monitoring for resource allocation resulting in the use of more safety personnel in cases where it was needed. So far the story is one of different Resilience Strategies, but it also involves the processes of Categorizing, Organizing and Mutual Treatment.

During the earlier days many visitors walked through the cordon of safety personnel to faster get in front of the stage, but this behaviour stopped when the safety personnel started dancing, pointing and high-fiving with the visitors. One part of the explanation for this seemed to lie in that Organizing was clearer, in that the sign 'Better spots further in’ was complemented with pointing, more clearly expressing guidance and expectations from the
safety personnel. Another part seemed to lie in the *Categorization* and *Mutual Treatment* in that the visitors perceived the safety personnel as friendly and more alike themselves when dancing and high-fiveing, working as mitigating processes. This is of course speculative and anecdotal and there were probably other factors affecting the change in behaviour on the visitors part as well, such as them becoming more and more used to the cordon over time. Even so, the story highlights the highly interconnected nature of the Resilience Strategies and the social processes of Aggravation and Mitigation.
4 Discussion

The safety organization at the festival had an enormous task to say the least. During 5 days 48,000 people participated in a festival held in a small town in Sweden, with more than 30,000 of them staying at one of several temporary camp-sites. To keep so many people safe during such conditions calls for a fairly complex organization, but at the same time this organization is highly temporary in nature, most of it only working together for a week. On top of this, this year’s festival had limited resources in the form of personnel, since it had been hard to recruit volunteers and many decided not to show up last minute. A festival of this kind is highly dynamic and unpredictable. The Law of Requisite Variety states that the variety of the outcomes of a system can be decreased only by increasing the variety in the controller of that system, in other words, the more dynamic the system, the more flexible the organization dealing with that system must be. The lack of volunteers in combination with an already highly dynamic event created a situation where the safety organization constantly had to adjust itself to handle the situations it faced.

Gathering lots of people in a small space always puts a strain on the organization responsible and when that space includes permanent structures crowd management becomes even harder. Many of the areas at the festival were limited in space and therefore they had to be managed so that they would not become overcrowded. This work included anticipation of when and where this would happen, monitoring for when it was about to happen, responding when it did happen and learning from mistakes to improve the routines. When the safety organization responded and started managing the influx to a specific area this necessarily restricted the visitors movement, therefore creating a situation where there could be potential crowd conflict. The results-section covered when and how the organization adjusted itself in relation to crowds and the work itself was described in the form of resilience strategies. The interaction between the safety organization and the visitors was also analysed from the perspective of the Aggravation and Mitigation Model and the social processes underlying potential crowd conflict were all found to be of mitigating nature and no crowd conflict was observed. Before further discussing the relation between the two areas of research, let’s first consider their strengths and weaknesses when applied to event safety.

4.1 Resilience and Resilience Strategies

According to Hollnagel (2011), resilience as a theoretical construct emphasis an organization’s ability to adjust under expected and unexpected conditions to maintain required operations. Other definitions usually put an emphasis on the ability to prevent, respond to or recover from disruptions. While Hollnagel also applies it to expected conditions, resilience usually focuses on handling the unexpected and unpredictable and this is where its strengths lie compared to more traditional approaches. The highly dynamic nature of large events is what inspired the use of resilience theory in the study in the first place, but as Furniss et al. (2011) notes the concept has been troublesome for several reasons. Among these reasons are that there has been no agreed criterion or approach for analysis and therefore the analyses has failed to build on each others’ work. The framework of Resilience Strategies therefore seemed promising for several reasons, the first being that it provided an approach and a way to structure the analysis. Even while a threat can be
unpredictable and unexpected, a suitable response might still be prepared. The CMRs are an excellent example of this. Sometimes the use of a CMR was predicted and therefore expected in advance and sometimes the time they were used was highly unexpected. In both cases however the organization adjusted itself the same pre-planned way in order to deal with the situation. While the timing of an event might be unexpected, the event itself might represent a well-known problem and have a prepared response. The second reason that the Resilience Strategies framework seemed promising was therefore that it allowed for the description of both improvised and recurring strategies. In addition to this the origin and development of recurring strategies could be described in terms of interactions between blunt-end management and sharp-end actions. Contained within the framework is therefore the ability to describe both pre-planned recurring strategies and recurring strategies that are evolved through repeated use of an improvised strategy. Even interactions back and forth between the blunt end and the sharp end could be described in the framework, for example how an established practice on the sharp end becomes a blunt end routine. The final promising attribute of the framework was that it provided a way to easily describe both single events and strategies abstracted from several observations, in extension providing a clear link between observations of resilience and abstracted strategies. Since the framework offered a structured way to describe resilience strategies regardless of domain, they also seemed to provide a platform for comparing strategies between domains and even abstract general resilience markers, not linked to a specific domain.

All of these potentials were realized and the framework even proved to be so effective that it helped in answering the two first research questions, when and how did the safety organization adjust itself in relation to crowds, instead of the other way around that was the expected order of analysis. The framework provided a highly graspable and yet sufficiently detailed description of the work performed by the safety organization in relation to crowds and on top of this it was easy to use and provided a clear analytical approach. While theoretical in nature, the framework could even possibly serve as a practical tool for in-depth analysis of strategies used by the safety organization, both in the creation and revision of routines, in the analysis of accidents and in learning from successful episodes.

The framework had two main limitations. The first and more trivial of these was that it provided no defined way to graphically represent a strategy which could be beneficial for their presentation. It might not be possible to provide a graphical representation that fits all domains and Resilience Strategies but the attempt at graphically representing the strategies that can be seen in Figures 6-13 hopefully provides the reader with an overview of each strategy and therefore an easier reading experience. This representation hopefully works in other domains as well, although when a larger amount of information is needed to accurately describe a strategy, this might not be possible. Another gain with such an representation is that it also provides sort of an cognitive anchor for thinking about the strategy and this brings us to the next current limitation of the framework, it provides no way to describe the relation between different Resilience Strategies.

Many of the strategies for managing crowds at the festival were interlinked. The effective work at a specific entrance might affect a CMR in that it receives a high amount of visitors in a short time, while crowd pen entrances in quite obvious ways affect the routines
of crowd pen balancing and density\textsuperscript{12}. The current framework provides no way to describe these relations which is a serious limitation. These relations can be simple or complex. An action in one strategy might for example be a force leading to an unwanted outcome in another strategy. Resources in the form of personnel and material are also commonly shared between strategies which is another relation to consider. One way forward for the framework could therefore be to separate the descriptions of forces and resources from the strategies themselves and instead describe these on a system-wide level. The forces that affects and are affected by a strategy and the resources that it uses could then more clearly be described in terms of what effects this has on the system as a whole. Despite its limitations, the yet young framework of Resilience Strategy was very useful and it shows a lot of promise for being the go-to framework for describing resilience work.

Resilience as an overarching theoretical perspective was perfect for the domain of event safety, which is dynamic, unpredictable and intractable. To use the words of the head of safety when he first heard the definition of resilience several months after the festival: "That pretty much sounds like our business plan and the credo we live by". A lot of lessons applicable to other domains could probably be learned by further studying event safety, a domain where things happen quickly and flexibility is the key to success. While the process of adjusting a routine in some domains can take several years, in event safety it literally happens over night.

4.2 Social Identity and Aggravation and Mitigation

Social identity and the Elaborated Social Identity Model (ESIM) has been widely used to explain the eruption of crowd conflict (e.g. Drury & Reicher, 1999; Reicher, 1996; Stott & Reicher, 1998). The idea is that we make sense of confusing crowd situations as members of a specific social category and are affected by the norms carried within that social category. In these situations, the actions of other groups acts as part of the context which we ourselves are trying to make sense of. When other groups have the power to act upon the larger crowd that we are at least spatially a part of, and this power is used in a way that is viewed as illegitimate, our social identification might slide towards identifying ourselves with the crowd, instead of the smaller sub-group that we previously identified ourselves with. This might in turn cause us to be affected by, and act according to, new norms which in turn provides a yet new context for the group exerting power over the crowd. In other words, a negative spiral can evolve.

When CMRs were used, the safety organization exerted power over the whole crowd of visitors in limiting their movement. Using the ESIM the reason crowd conflict did not evolve can be explained in two separate ways. The first explanation is that the visitors understood why the safety organization had to limit their movement and thus viewed its actions as legitimate. Because of this no shift in social identity took place and an overarching social identity encompassing the whole crowd did not form. The second explanation is that the individual members of the crowd did come to socially identify with the crowd as a whole, but because there were no prior history of conflict, and no extreme sub-groups within the crowd had violent norms to begin with, the overarching social identity did not induce a norm-shift towards violence.

\textsuperscript{12}See 3.3 Linking it all together for an example of how different routines can effect each other.
While social identity is described as stemming from comparative and normative fit, the concept itself seems hard to measure and provides no clear guidance for analysis. This is not surprising considering the complex nature of the phenomenon and the social identity-models still provide analytical opportunities. The Aggravation and Mitigation Model however provides a more tractable way to analyse events than the ESIM offers. The results show that the processes of categorizing, organizing and mutual treatment were all mitigating in nature which supports the notion that mitigating processes are important in avoiding crowd conflict. This could be seen either as a complement or an alternative to ESIM in explaining the absence of crowd conflict. Hylander and Granström (2010) states that the AM-model was developed separately from ESIM, but supports its main conclusions, therefore it seemingly should be able to in itself explain the absence of crowd conflict. While the AM-model does provide a tractable way to analyse the unfolding events between crowds, it has a limitation in that it fails to take into account the initial values of those involved.

Why did crowd conflict not erupt at the festival when an out-group with power enforced its view upon a whole crowd of people? In the end this question is probably best explained by a combination of two things. First of all, in contrast to other situations common in the research, such as the police managing demonstrations or sporting events, there was no history of conflict between the involved parties and no sub-groups were present with the explicit goal of creating conflict. Secondly, the social processes taking place between the involved parties were mitigating in nature, therefore further reducing the chance of crowd conflict evolving. Neither the ESIM nor the AM-model fully accounts for both of these explanations and using them in conjunction provides a clearer picture.

The easiest way to envision how the two models can be combined is to consider how closely mutual trust in the AM-model is related to the concept of legitimacy in the ESIM. Using this as a common denominator creates a common ground for combining the models where each can be used for what it does best. The ESIM can be used to understand who those involved in crowd situations are in terms of identity as well as their history, and also why a shift in this social identity can lead to crowd conflict. It is not as well suited for explaining the exact processes that determine why the out-group’s action comes to be viewed as legitimate or not, possibly causing said shift. The AM-model however is well suited for analysing just these processes, but is on the other hand not as well suited for explaining who those involved are, or why and how low mutual trust (or legitimacy) leads to crowd conflict. In short, it could be beneficial to incorporate the AM-model into ESIM as a way of providing a clearer analytical framework for analysing the processes that leads to the groups viewing each others actions as legitimate or illegitimate (or developing mutual trust) in a given situation. Combining the models might require reworking them somewhat, but this also provides further opportunities for expanding the theories. Incorporating the AM-model into ESIM could for example provide new perspectives on what processes or categories should be included in the model.

4.3 Crowd Management, Crowd Control and Crowd Conflict

The difference between crowd management and crowd control is pretty much what it sounds like. Management deals with exactly that, managing, guiding or making things easier for the crowd, while control deals with physical control, usually associated with
police tactics. It should come as no surprise therefore that crowd conflict is more common in crowd control situations, or perhaps that crowd control might be required in crowd conflict situations\(^\text{13}\). A really perceptive reader might have noticed that this dichotomy corresponds to the dichotomy of the words safety and security. While crowd management is usually employed to keep a crowd safe from unintentional accidents, crowd control is usually employed when there is a security concern, that is, when there is a fear for intentional violent or criminal acts. Most would probably agree that a situation where only crowd management is needed is preferable. The million dollar questions would therefore be "How do we avoid escalating a 'crowd management'-situation into a situation where crowd control is needed?" and "How do we de-escalate a 'crowd control'-situation into a situation where only crowd management is needed?". While usually worded differently, without the use of the concepts of crowd management and crowd control, these are really the questions that underlie most research into crowd conflict. Both of these goals requires interaction with the crowd. Interaction between individual members of the crowds happens during normal circumstances, but interaction with the crowd as a whole usually requires special circumstances. Special circumstances usually requires the organization dealing with the crowd to adjust itself to handle the situation, deploying pre-planned or improvised strategies in doing so, strategies that can be described with the Resilience Strategies-framework.

Could the Resilience Strategies-framework be used as a tool to avoid or de-escalate crowd conflict? Probably not, but it could possibly aid in clearly describing the strategies used when dealing with crowds and as such, it could aid in analysing the effects of these strategies, especially with a focus on the information provided to the crowd. Sudden, unexplained actions creates uncertainty and is an aggravating process contained within the category of organizing in the AM-model. Explaining actions taken and expected behaviour on part of the crowd on the other hand is a mitigating process and therefore creates trust and legitimacy for the organization's actions. While crowd control was not studied in this thesis, clearly incorporating information as part of strategies for crowd control should be equally mitigating and might lead to a de-escalation of conflict, used together with other measures. Since these situations tend to be highly stressful and time-sensitive, it is important that planning includes not only a strategy for providing information, but the content of that information as well. Otherwise the risk is that informing the crowd is not prioritized in the situation, and that the information given is of bad quality, that is, uncertain and lacking. Bad or conflicting information could create confusion instead of clarity and thus be equally aggravating as no information at all. It is the author's firm belief that the importance of providing the correct information in strategies for dealing with crowds can not be emphasized enough.

The police, working with law enforcement, deals naturally with security issues. Indeed, one of their main tasks is that of preventing crime, thus keeping the population secure from the intentional harm of others. Safety and the prevention, as well as recovery, from unintentional accidents is however more often associated with fire and rescue departments. In working with crowds, both crowd management and crowd control might be needed which puts special demands on the police organization which usually deals with security issues. While the police should not be experts on crowd management\(^\text{14}\), there are many situations

\(^\text{13}\)This seems to be the classic chicken or the egg situation.

\(^\text{14}\)Crowd management should in a large extent be the responsibility of anyone organizing an event.
in which competence in crowd management will be beneficial for the police as an organization. While police work has not been the focus of this study, it is the author’s belief that the distinctions between crowd management and crowd control, between safety and security, are important to consider for avoiding crowd conflict. The risk that arise if the police is only involved in situations that require crowd control, is that the mere presence of police officers might be perceived as the beginning of crowd conflict, a less than ideal situation. Taking a limited, but active, part in crowd management, which often entails providing information and guiding the way, provides an excellent opportunity for positive categorization, organizing and mutual treatment, thereby facilitating mutual trust on an early stage.

4.4 Method discussion

The overall method used in this study was an ethnographic one, complemented with structured visitor interviews and observations performed by assistants. The ethnographic approach in itself consisted of three parts. Observations during planning, pre-festival observations and observations during the festival itself. Planning material was also reviewed and included in the final data set. Overall these methods were a good way to collect large amounts of data relating to the research questions, from multiple sources. The different methods for collecting and analysing data will be further discussed below.

First of all the author’s involvement with the safety organization should be mentioned. While this was discussed in 2.1 The researcher’s role and bias it is important to note that this has strong methodological implications. As previously mentioned, the fact that the author had previously worked with the safety organization is what allowed for this study to happen in the first place. Being previously known to the organization is what allowed for the unprecedented access to the organization’s work, personnel and material, which was needed to answer the research questions about the organization’s work with crowds. It is important to note that while the author had some previous experience of crowd management-work, this was largely an unknown area of event safety. Being involved in the planning process was therefore an important step in the method, letting the author familiarize with crowd management as it was being planned for. Ethnographic method is not an objective method and subjective involvement is actually key. This means that in a large extent the descriptions of the safety organization and its work is necessarily a subjective one and one that focuses on the view of the safety organization. This being said, efforts were made to triangulate data with multiple sources in the cases where this was possible, especially in the events where the safety organization and the visitors interacted. This was also one of the main reasons why assistants where used to perform interviews with the visitors, in an effort to counteract what Drury and Stott (2001) calls partiality of access to materials and observations when it came to the research questions about the social identity of the festival visitors. Combining research questions relating not only to two different theoretical frameworks, but also two different involved parties was a challenge, but the methods used for data-collection in the study were in many ways perceived to help overcome these challenges.

While observations and reviewing of the planning material helped in understanding the crowd manager’s role in said planning as well as crowd management as a whole, the observations during the weeks before the festival had another goal. The final preparations and planning before the festival took place on-site during the weeks leading up to the
festival. Being present during these weeks meant that the researcher was informed and up to speed on the latest developments coming up on the festival. Many interesting events and discussions were observed during these weeks that lead to a better understanding for events that were taking place during the festival. Since much of the planning was finalized during these weeks, this also lead to the researcher being able to create an unbroken timeline between planning certain routines and the execution of said routines, increasing the validity of their descriptions. The observations that took place during the festival itself consisted of shadowing the crowd managers and observing specific events, both as decided upon beforehand using the risk-analysis, and as unexpected events transpired. This meant that the researcher had to actively prioritize between observing different events according to what seemed to be most interesting for the study at any given time. Having observed and taken part in the planning process to such an extent was highly beneficial to making these decisions, since judging the importance of different events was helped greatly by the background information gathered. Even so, choosing to observe one event necessarily excludes others and no claims are made that the study captured everything of interest at the festival, far from it.

The structured observations made by the assistants was a way to complement the researcher’s own observations and contributed not only in that they described additional interesting events, but also in that they helped validate some of the researcher’s observations. The assistants’ observations were especially helpful in validating the results related to the visitors’ social identities and their interaction with the safety organization, since the events they observed corresponds with those made by the researcher. Since the research questions related to the festival visitors were the most sensitive with regards to bias on the researchers part, validation through observations performed by multiple assistants greatly increases the validity of these results.

Using assistants to perform visitor interviews was not only beneficial to counteracting the previously mentioned partiality of access to materials and observations, but it was also strictly necessary time-wise. The researcher simply would not have had the time to also perform interviews with the visitors. Structured interviews were deemed to be the best approach since the assistants were only temporarily involved in the study and thus did not have the background necessary to perform effective semi-structured interviews. On top of this a large amount of interviews were expected and answers were taken in the form of notes, so time-constraints also advocated the use of structured interviews. Using predetermined questions necessarily limits the responses the visitors can make, therefore having a focus-group discuss different matters more freely as a basis for creating the structured interviews was considered, but was determined against on the basis of time constraints. Such a focus group would probably have been beneficial in shaping relevant questions to be used in the interviews. Even so, the interviews did gather a large amount of interesting data on the visitors and their views of each other, the festival and the safety organization. The sampling method that was used to counteract sampling bias (pick a number x, ask the x:th person crossing an imaginary line) was very successful. The method was so successful in fact that the assistants’ told a few stories where they had been ill at ease after approaching highly intoxicated visitors that the method had randomly picked out. These visitors almost never chose to participate in the interviews, but even when the assistants suspected this would be the case, the visitor was approached anyway. This leads us to the main limitation of the
interviews. It cannot be ruled out that a certain type of visitors chose to take part in the interviews, thereby skewing the sample. Indeed, the assistants did report that intoxicated younger visitors were least prone to participate in the interviews, and even though this was a subjective feeling it is worth taking into account. Even though they might have been less prone to participate however, all kinds of visitors are represented in the interviews. In combination with the qualitative nature of the study, this is less troublesome than if it was of a quantitative nature. Even so, one cannot help wondering what those 88 people that did not participate in the interviews would have had to say.

4.4.1 Analysis. Using a theory-driven latent thematic analysis was not a very controversial choice of analysis-method. The research questions demanded going beyond the surface meanings of the observations so using a latent approach was necessary. Since the research questions were grounded in theory in such a way as they were, using a theory-driven approach was the natural choice. Other results would certainly have been found using a data-driven approach, but they would probably not have been as relevant for the chosen research questions. One theme of interest that would probably have been further developed if using a data-driven approach however is how the consumption of alcohol affects changes in social identity and the categories in the AM-model. This has not been extensively explored in the literature and was not part of the research questions, but the author still found this a potentially interesting subject for future study.

Despite the uncontroversial choice of the main analysis method, there are two methodological concerns that are worth taking a closer look at. First of all, the use of summative content analysis to analyse the interviews was in itself not a strange choice, on the contrary this was found to be a highly useful method of analysis for the given data. The decision to not present these data on their own, but to instead include them in the following thematic analysis however is one that may look a bit controversial and should therefore be motivated further. Upon completing the summative content analysis a multitude of different keywords and meanings were the result. Some of these were connected to a specific question and some of them were recurring throughout the interviews. These keywords and their latent meanings however were produced in a data-driven way, not taking into account the theoretical foundations of the study and as such, they were not in their current state directly related to the research questions. Hence, there were two specific reasons for including these results in the thematic analysis for further analysis instead of presenting them as they were. First of all, further analysis was needed to relate the interviews to the rest of the data and secondly, further analysis was needed to relate the interviews to the specific research questions. Using a summative content analysis to analyse the interviews could thus be equally seen as an analysis in itself as it could be seen as a processing of the interviews so that they could better be incorporated and more easily analysed using the thematic analysis. When a keyword and its related meaning was found to be interesting in relation to observations or other data in the thematic analysis, the interview-data related to that keyword was always revisited and so no context was lost in combining the two methods. All in all, the summative content analysis was really helpful in identifying interesting data in the interviews, and in relating what the visitors talked about to the rest of the data and the research questions.

The second methodological concern for the analysis is the fact that only one person coded the data. While this is common fact and necessity in qualitative individual thesis's not performed within the context of a larger project, it is still always troublesome for the
validity, reliability and generalizability of the results. Great effort was of course made to avoid bias in the coding and analysis of the data, such as the method of triangulating events from different sources, but even so, it can never be guaranteed that another coder would not have analysed the data differently. The subjective nature of parts of the study has been clearly emphasized and is also one of its strengths. The author is confident that the results would hold up under scrutiny and that while it is possible that other coders might have coded parts the data somewhat differently, the main conclusions would still stand.

4.5 Future research

Since the study has been successful in showing that the theories of resilience and crowd psychology can be applied to the domain of event and crowd safety it also shows that future research in the domain is highly feasible. This could be highly rewarding both with regards to the domain itself, where the need for a systems-approach has only recently been emphasized, and with regards to the theoretical approaches. In some domains where systems are stable and safety is high, it can be hard to directly observe resilience strategies since there might seldom be a need for such strategies. If the system is stable, adjustment might not be commonly needed in order to maintain control and avoid undesirable outcomes. Studying resilience in the domain of event safety might therefore be one way to easily observe actual resilient behaviour, which might be one way to expand upon the theories. Since a systems-approach has only recently been emphasized when it comes to event and crowd safety (Understanding Crowd Behaviours: Guidance and Lessons Identified, 2010) there is not a whole lot of research into the area, Helbing and Mukerji (2012) providing a notable exception. Far more research is needed on the subject and resilience provides one, but obviously not the only, attractive paradigm for doing such research. Using the framework of Resilience Strategies provides a basis for comparing strategies for dealing with crowds between organizations and might even be used in an effort to eventually gather and describe best practice. Since this study only focused on one specific event, studying other events and other organizations would help validate, generalize and bolster the results. The framework itself would benefit from a clearer way to describe how strategies relate to each other. This could probably be done by separating the description of forces and resources from the strategies themselves and instead describe them on a system-wide level. This would help in describing the strategies relations with each other and the system as a whole.

In future studies of crowd conflict, it would be beneficial to combine ESIM and the AM-model, seeing how these complement each others weaknesses. While this study has shown that these models are perfectly applicable to the interaction between visitors and safety personnel at a music festival, more research is needed. Mitigating and peacekeeping strategies seem to be equally important in avoiding crowd conflict as the lack of aggravating behaviour. Since crowd conflict is unusual at these kinds of events and mitigating strategies were abundant in this study, it would be fair to say that there is more to be learned about mitigating and peacekeeping strategies from studying these kinds of events and the interaction between visitors and safety personnel. An especially interesting domain for studies of this kind would be sporting events where safety personnel is used, since they include a different kind of visitors and sometimes a history of crowd conflict. Finally, the connection between alcohol, social identities, the AM-model and crowd conflict should be further studied in order to better understand the role of alcohol in these social processes.
5 Conclusions

This study set out to explore the use of resilience theory and crowd psychology to study the domain of event and crowd safety and it has done so by answering eight research questions. These concluding remarks will start off by summing up the answers to each of these research questions and will then move on to present what these answers mean in relation to the overarching purpose.

- Resilience

1. In what circumstances do the safety organization adjust itself under expected and unexpected conditions relating to crowds?

The situations in which the safety organization adjusted itself were very diverse. They included everything from work at the entrances of the festival to managing the crowds watching concerts or waiting in line to performances. When analysing the situations further, two common denominators were found to underlie when these adjustments happened:

- When there was a risk of crowd density and pressure building up
- When established structures or routines for handling crowds were found not to work or have room for improvement

2. In what ways do the safety organization adjust itself during these conditions?

The ways in which the safety organization adjusted itself during the festival were as diverse as the situations in which they did so and the specifics of each adjustment were highly contextual. Three main ways in which the safety organization adjusted itself were found however:

- Resource allocation - For example deploying more personnel to an entrance, or making sure that there were enough personnel to handle a CMR
- Restricting access to areas - For example by a soft or hard closedown, sealing off a stage that was about to get overcrowded, closing the entrance to a crowd pen, in conjunction with this cues were often created for orderly management of the crowd outside of the area
- Giving information - For example in conjunction with a closedown informing the crowd by signs or verbally that the area was full, or that there were better spots further in at a crowd pen

3. What resilience strategies can be found for managing regular threats?

While each situation was unique and responded to in slightly different ways, several strategies for managing threats could be abstracted from the observed events. Much of the work that the safety organization undertook that was related to crowds can be summed up in these eight strategies:

- Crowd management routines
- High crowd density in cue
- Crowd pen density
- Crowd pen opening and closing
- Crowd pen balancing
- Entrances
- Monitoring for efficient resource allocation
- Adjusting routines

- Crowd Psychology

4. Social Identity

(a) What social identities are salient among the visitors?

During interviews with, and observations of, the visitors, it became clear that they were such diversity that there really were no salient social identities. Or rather, that any social identity present outside of the festival could also be represented at it.

(b) In what situations does a change in social identity happen?

The study failed to find any situations where a change in social identity clearly happened. Highly ephemeral situations such as when visitors participated in cheering songs were speculated to possibly have affected their social identities, but no supporting evidence was found to indicate that this was the case.

5. Aggravation and Mitigation Model

(a) How do visitors and the safety organization categorize each other?

The visitors categorized the safety organization in a positive way and seemed to differentiate between both different parts of the organization and between individual members. While many of the actions taken in response to crowds were categorizing in their very nature, the safety organization did differentiate highly between different visitors in these situations and negative actions on behalf of single visitors were not seen as representative for the whole group. The social process of categorizing was found to be of mitigating nature.

(b) What organizing elements can be identified?

There was an abundance of organizing elements at the festival in the form of static and temporary signs, verbal information, static structures such as fences for cues, clothing to signal who were safety personnel and who were safety managers and many, many more. Providing clear information to the visitors was a highly prioritized task in the safety organization and it was almost always built into the routines for dealing with crowds. While
the visitors were not organized and rather contributed to confusion and the chaotic nature of some situations, this was not intentional and neither did the safety organization seem to ascribe intentionality to these actions. The social process of organizing was found to be of mitigating nature.

(c) How do visitors and the safety organization treat each other?

Interaction between the visitors and the safety organization was friendly and polite. Provocations were few and when single visitors acted in a provoking way, members of the safety organization did not let themselves be provoked. When safety personnel or deputized security guards needed to reprimand visitors that were breaking rules, they started doing so in a nice tone. The social process of mutual treatment was found to be of mitigating nature.

Resilience Strategies were found to be a very robust framework for describing the work undertaken by the safety organization in relation to crowds. Other parts of the safety organization’s work can probably be described using this framework as well, but this was outside the scope of the study. One quite large limitation in the framework was found however, in that it was hard to describe the relations between the different strategies that in reality often affected each other in different ways. The need for a system-approach when undertaking crowd management has recently been emphasized and this study shows that resilience theory is one feasible avenue for further exploring crowd management-work.

The question of why crowd conflict did not erupt during the use of CMRs, when an out-group with power enforced its view upon a whole crowd of people, is best answered using a combination of ESIM and the AM-model. Using only ESIM provides no clear description of the mitigating social processes underlying the mutual trust between visitors and the safety organization. Using only the AM-model on the other hand does not take into account the initial values of the visitors and that no sub-groups were present with the goal of creating crowd conflict. Neither does it take into account the history between the two groups. Combining ESIM and the AM-model can therefore create depth and clarity in explanations of crowd conflict or the absence thereof.

The safety organization’s strategies for managing crowds had a lot of focus on providing information to the visitors involved. This information included what was happening and often also what behaviour was expected of the visitors. Including information as a core element in strategies is not only an effective tool for managing crowds in that it communicates expected actions on the visitors part, it also works as a highly mitigating and peacekeeping social process and avoids crowd conflict. Since the result of this mitigating social process is mutual trust between the visitors and the safety organization, this further facilitates the work of managing the crowd. While the importance of providing information is not by any means new knowledge, this study has among other things provided depth to the explanations of why this is the case, not only as a means for keeping the crowd safe, but also as a means to avoid crowd conflict.
6 References


Appendix A
Interview Guide

"Hej! [namn och namn] heter vi och bedriver en studie här på Festivalen, skulle vi kunna få ställa några frågor? Det tar ungefär 5 minuter och är helt anonymt."
Om ja – "Vad bra! Detta är inte en utvärdering av festivalen på något sätt och det är viktigt att du svarar sanningsenligt. Du kommer få mer information om studien efter intervjun.
Om nej – "Tack ändå, då får vi önska en fortsatt trevlig festival!"

1. Anteckna kön
2. "Hur gammal är du?"
3. "Hur många gånger har du varit på festival?"
4. "Hur många gånger har du varit på Festivalen?"
5. "Är du eller har varit funktionär någon gång?"
6. "Om en lokaltidning som handlade om festivalen intervjuade dig med en fråga i en kortspalt som den här [visa tidningsspalt], vad skulle du då vilja att det stod under ditt namn?"
7. "Vilken är den viktigaste anledningen till att du är här?"
8. "Var bor du nu när du är på festivalen?"
   (a) Om camping - "Hur många är ni som bor tillsammans? Känner ni varandra sen tidigare?"
   (b) Om i trakten – "Bor du hos någon annan eller har du någon annan boende hos dig?"
9. "Hur många personer är ni ungefär som brukar gå på festivalområdet tillsammans?"
10. "Hur skulle du beskriva stämningen på festivalen?"
11. "Hur skulle du beskriva de som är på festivalen?"
   (a) Om detta inte framträder - "Finns det olika typer av besökare?"
   (b) Om ja – "Vilka typer?"
12. "Gör du saker på festivalen du inte skulle göra i andra sammanhang?"
   (a) Om ja - "Vad och vad beror det på?"
13. "Tror du att det finns en risk att händelser kan spåra ur här på festivalen?"
14. "Vilka typer av säkerhetspersonal tror du finns på festivalen?"
15. "Vad är ditt intryck av funktionärerna och personalen på festivalen?"
16. "Vad är ditt intryck av ordningsvakterna på festivalen?"
17. "Har du någon gång inte kommit in på en spelning du velat se?"
   (a) Om ja – "När och hur förstod du att det var fullt?"
18. ”Har du sett något som du skulle beskriva som våldsamheter eller aggressivitet på festivalen?”
   (a) ”Tror du att det är vanligt?”
   (b) ”Varför/varför inte?”
   Om ja:
   (c) ”Vilka var det som deltog?”
   (d) ”Vet du vad som startade det hela?”
   (e) ”Vad hände sen?”

19. ”Var brukar du stå när du ser på en konsert?”
   (a) ”Varför det?”

20. ”Hur känns det att stå på en konsert med många människor?”
Appendix B
Newspaper Column

Frågespalten

Figure B1. The visual aid used in for one of the interview-questions
Appendix C
Observation Guide

Guiden beskriver vilka situationer och beteenden som är önskvärda att observera och rapportera kring.

**Vilka situationer bör observeras?**

- Alla situationer där någon form av våldsamhet förekommer (dock inte skojbråk eller liknande).
- Situationer där folksamlingar (över 10 personer) gör något som får betecknas som ”ovanligt” (till exempel tingeltangeltåg, rusningar, spontana lekar som involverar en större mängd personer).
- Var uppmärksam på gruppbeteenden - Situationer där hela grupper (över 5 personer) agerar på ett tydligt sätt i samspel med andra grupper (positiva och negativa samspel, tex hejaramsor)
- Situationer där ordningsvakter ingriper fysiskt på något sätt mot personer eller grupper. (Titta här särskilt på omgivningens reaktion.)
- Var uppmärksam på situationer där säkerhetspersonal kommunicerar med flera människor samtidigt, till exempel via megafon, skyltning, upprepad kommunikation etc, vad blir respons?

**Vad bör observeras i situationerna?**

- Vilka är inblandade?
  - Antal aktivt inblandade
  - Beskrivning av inblandade
  - Tydliga grupperingar? Vad särskiljer dem isåfall?
- Stämning (Din tolkning)
  - Positiv/negativ?
  - Lugn/energisk?
  - Tydlig/kaotisk?
- Vad händer? Försök att inte lägga in egna värderingar eller tolkningar i beskrivningen.
- Kommunikation
  - Vilka kommunicerar?
  - Vad sägs?
  - Sker någon icke-verbal kommunikation?
  - Hur är kroppspräket och hållningen?
- Egna reflektioner
  - Hur uppfattade du situationen?
  - Varför tror du att den uppstod? (Motivera)
  - Finns det något annat värt att nämna om situationen?
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