MIRROR: Improving coordination in multidisciplinary crisis management teams

Lisette de Koning
TNO
lisette.dekoning@tno.nl

Mirjam Huis in 't Veld
TNO
mirjam.huisintveld@tno.nl

Kim van Buul-Besselink
TNO
kim.vanbuul@tno.nl

Kees van Dongen
TNO
kees.vandongen@tno.nl

Dianne van Hemert
TNO
dianne.vanhemert@tno.nl

Rosie Paulissen
TNO
rosie.paulissen.tno.nl

ABSTRACT

In crisis situations different organizations have to cooperate to gain shared situation awareness and to take accurate decisions. However, several evaluation studies of crisis mitigation processes indicate that it is hard to effectively coordinate efforts of all organizations involved. The goal of our project is to improve coordination in crisis management teams, by improving the interaction processes in a crisis management team. The project consists of two main steps. First, the development of MIRROR, i.e. an overview of 16 relevant factors that influence team interaction. Second, the development of a training based on MIRROR. We expect MIRROR and its training module to be a useful tool for team members of crisis teams. In addition, MIRROR has the advantage that it can be applied in non-crisis teams, during daily situations, as well. This enlarges the chances for potential team members of crisis teams to increase their team interactions skills.

Keywords

Coordination, multidisciplinary teams, training, interaction, multi-team systems, vital infrastructure, liaisons

INTRODUCTION

'The storm and rain from the previous weeks caused a high water level in the Rijn river. The water board analyses the situation and expects that the situation will get worse. Because there is a threat of a flood a crisis management organization is formed."

In this scenario several questions have to be answered: What is the possibility of a flood? What area is threatened? What are the consequences for the dikes? No single organization has the knowledge and (actual) information to answer all these types of questions, nor to take accurate action. In this situation, but also in other types of incidents and crises, a number of organizations have to cooperate to gain shared situation awareness and to take accurate decisions. Organizational units are assembled from, for example, the police force, the fire departments, and the paramedics, to deal with unexpected situations that require the coordinated effort of different organizations for a limited time span. Because of the interdependencies between the tasks of these organizations effective coordination is needed. Malone and Crowstone (1994) define coordination as "the act of managing interdependencies between activities performed to achieve a goal". Several evaluation studies of crisis mitigation processes in the Netherlands indicate that it is hard to effectively coordinate efforts of all organizations involved (Capgemini, 2008; Helsloot, 2005). In this study we aim to improve the coordination process in crisis management teams on regional level by developing a training. We focus on tactical and operational teams that have to coordinate the activities of different parties at the incident place or the effect area.

First, we identified what bottlenecks organizations run into when coordinating during a crisis. We interviewed seven domain experts who have the role to participate in a crisis management team in case their organization needs to be represented. The interviewees were three leaders of a crisis management team and four liaisons from organizations responsible for critical infrastructures, e.g. a railway company.

A large amount of bottlenecks that were mentioned by the interviewees, are caused by the fact that many different organizations are a candidate for participating in a crisis team. Examples of bottlenecks that were mentioned are: misunderstandings, unfamiliar with tasks and roles of other organizations, different perspective and conflicting interests. Current training and exercises available for crisis management teams often focus on getting to know each other's organization (better) in advance. This improves coordination, because team members learn for example who has what expertise, and who needs what information. However, not all relevant aspects and settings can exhaustively be learned this way. Other interventions that are being implemented to increase the quality of coordination in crisis teams focus on plans and agreements between candidate organizations, for example by agreeing on work procedures in a memorandum of agreement. Lalonde (2007) explains that these are important steps in order to master hazards. However, he continues to say that plans and agreements may also give a false sense of security to members of crisis organizations.

We concluded that a substantial part of the bottlenecks mentioned, are caused by factors that influence the quality of interaction in a crisis team, for example 'team diversity'. All team members of a crisis team have a different background. These differences result in a different perspective on the situation, which affects the quality of interaction. If team members are not aware of this difference in perspective, it easily results in misunderstandings. The quality of the interaction between team members, for example during a crisis management meeting, is important for sharing information and managing interdependencies between the organizations. We therefore decided to invest in improving the interaction between team members by providing insight into factors affecting team interaction processes. We expect that this improves coordination between the team members. We think it is more useful to have insight into these factors, instead of – or in addition to – learning about the background of (all potential) other team members or planning every detail in advance. In other words, we chose to focus on developing the soft-skills of a crisis team, which is in line with the recommendation of Crichton, Ramsay and Kelly (2009).

The next step we, was to specify factors influencing the interaction of team members in a crisis management team, thereby laying the foundation for the training. These will be described in the subsequent paragraph.

FACTORS THAT INLFUENCE MULTIDISCIPLINARY INTERACTION

We focus on a crisis management team that comes together in a face-to-face meeting to communicate and share relevant information in order to build an accurate picture of the situation, and to make accurate decisions. If one of the team members shares information, this information is interpreted by the other team members. How this information is interpreted is influenced by different factors, like the background of each team member. Also, different group processes, like the process of groupthink (Turner & Pratkanis, 1998), might influence what information is shared. Based on a literature review and interviews with domain experts, we identified 16 relevant factors in three categories that affect these interaction processes. The first category consists of 'situational factors', referring to external factors which cannot be changed by the team. The second category consists of 'team factors', referring to characteristics of the crisis team. The third category consists of 'psychological mechanisms', these are (automatic) processes that effect the perception, selection and interpretation of information by individuals and groups. We refer to our overview of factors as MIRROR, see figure 1, and this will be the main core of our training. We will give a short description of each factor.

Situational factors. *Task complexity:* Different features of a task cause complexity, e.g. uncertainty, changing plans, interacting parts. *Time pressure:* When team members have to perform too many tasks in too little time. *Impact*: A crisis has a high impact on society, this might concern e.g. direct consequences (amount of casualties) or economic consequences (Paton & Flin, 1999).

Team factors. *Team diversity:* Team members may differ on task related aspects (e.g. knowledge and expertise) or relation-oriented aspects (e.g. gender) (Jackson, May & Whitney, 1995). *Team maturity*: Team maturity refers to the extent to which team members have worked together and developed as an intact team (Swezey & Salas, 1992). *Trust*: Trust is psychological state that manifests itself in the behaviors towards others (Costa, Roe, Taillieu, 2001). *Leader:* The leader of a team has an important impact on the performance of a team (e.g. Judge, Piccolo, Ilies, 2004). *Different interests:* When team members represent different organizations, they might have different interests or even conflicting interests. *Expertise and terminology:* The specific knowledge, skills and attitudes that team members have and the terminology that they use to communicate.

Psychological mechanisms. *Attention:* A psychological process causing that people focus on one aspect of a situation, while ignoring other aspects. *Interpretation:* A psychological process causing that people give a meaning to information based on e.g. the situation, their knowledge and experience. *Prejudice & stereotyping:* People use stereotypes to categorize people based on characteristics of a group, such as nationality or occupation (Schaller, Conway, & Tanchuk, 2002). *Ingroup-outgroup*: The tendency of people to categorize people in

groups, and to identify oneself with a group. People have a preference for their own group. *Groupthink*: The tendency of people in a group to reach consensus without critical evaluation of alternative ideas of viewpoints (Turner & Pratkanis, 1998). *Sunk costs:* The tendency of people to continue a chosen direction once an investment in money, effort, or time has been made (Arkes & Blumer, 1985). *Dominancy:* When someone is dominant during a meeting, they have more influence (Levine & Moreland, 1990) and people treat him or her as an informal leader.

In addition to this short description of all factors, we will describe for one factor in each category how this factor influences team interaction. We will do this for 'impact', 'team maturity' and 'ingroup-outgroup'.

Impact: A crisis has a high impact on society. For each organization, a crisis might have a different impact. Depending on the type of crisis this might be: direct consequences, like causalities and injured people; economic consequences, like financial costs because of damage; social and psychological impact, like fear and anger among citizens; ecological consequences, like damage to the environment, pollution. These different types of impact have to be taken into account when taking decisions. This influences the pressure in the team.

Team maturity: A crisis team is an ad hoc team. Depending on the type of the crisis and the time of occurrence different team members will take place in the team. People may know each other and might have worked together, but the team as a whole has no history together. This might influence how well they know who has what expertise and who needs what information.

Ingroup-outgroup: If there is a strong cohesion in a team and there is one liaison that is less familiar with the other team members, the ingroup might judge their own ideas as more superior and are less likely to listen to someone from the outgroup.
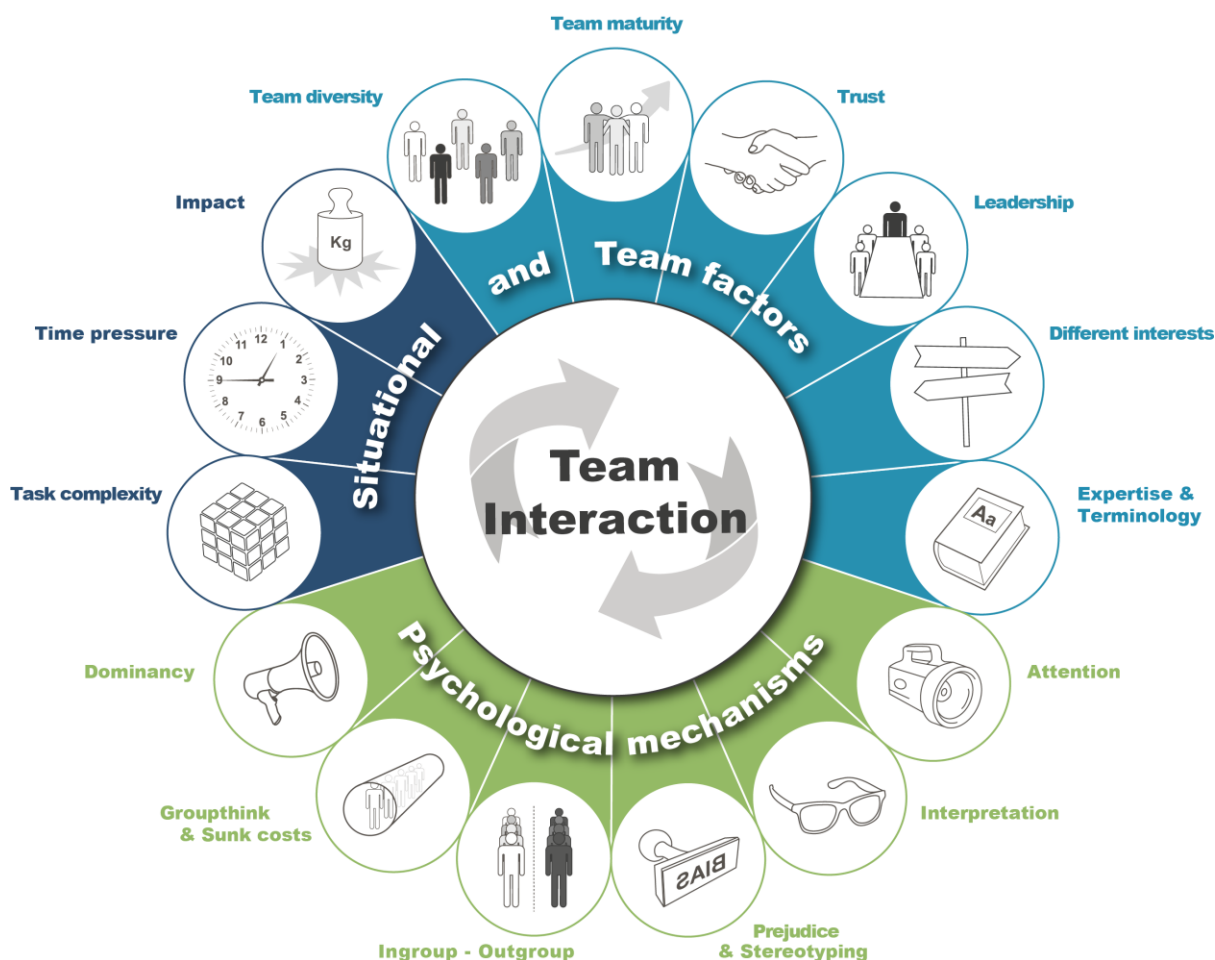

Figure 1. MIRROR, representation of factors that influence interaction

MIRROR REFLECTION MODULE

To be able to improve the interaction in a crisis team it is necessary that all team members:

- gain insight into what factors influence interaction
- experience how these factors influence interaction
- know how to improve interaction

To achieve these goals we are currently developing the 'MIRROR reflection module' suitable to be applied for training purposes for crisis teams. The module consists of four different steps to achieve the learning goals. The crisis team in training is confronted with a crisis scenario and has the assignment to control and mitigate the incident. The scenario entails the necessity to share information with all disciplines present to build an accurate picture of the situation and to take adequate decisions. First, each team member receives information about the crisis that is specific for his own expertise. The participant has the opportunity to ask questions and collect more information (step 1). The following step starts about 10 minutes later: the participants take place in a team meeting. An important goal of this meeting is multidisciplinary coordination and decision making (step 2). After this meeting, team members reflect on the interaction processes that occurred during the meeting using MIRROR (step 3). The reflection module includes so-called reflection cards with 'reflection' questions, that relate to specific factors. Examples for 'terminology and expertise' are: 'Did team members use terminology that you didn't understand?, or 'Did you use terminology that other team members didn't understand?'. An example for 'different interests' is: 'Did you know what the interests were of the other team members?'. Team members discuss the answers. After that, an explanation of how different factors influence interaction is given by using MIRROR and is illustrated by photographs (see figure 2). Team members receive tips, and discuss how they can improve the interaction (step 4). Subsequently a new round starts: each team member receives new information about the same scenario (step 1) and again they discuss this in a fictive crisis meeting (step 2), followed by a reflection and insight session (step 3 and 4).

Because of practical constraints it is difficult to train with all possible liaisons that might participate in a crisis management team. However, the competencies that people learn during this training – team interaction skills – are generalizable to teams in other settings as well. In other words, the factors described in MIRROR can be used to reflect on team interaction in non-crisis situations as well, for example during a normal team meeting. In this way, MIRROR supports training team interactions skills, without having to train with all different liaisons that might participate in a crisis team.
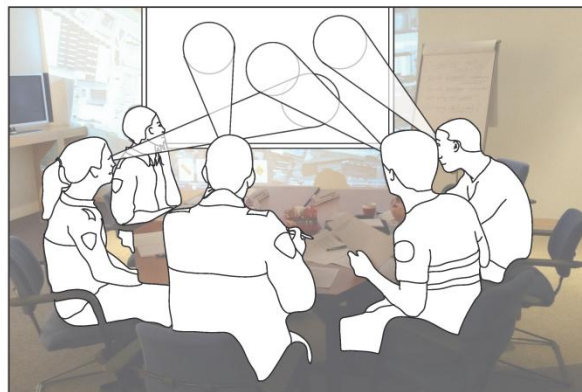

Figure 2. Picture that expresses attention

SUMMARY AND CONCLUSION

The goal of our project was to improve coordination in crisis management teams. To achieve this goal we focused on improving the interaction processes of a crisis management team, because the quality of this interaction is relevant for adequate coordination. The project consists of two main steps. First, we developed an overview consisting of 16 relevant factors that influence coordination in crisis management teams. Second, we developed a training to provide team members more insight into these factors, to experience the effect of these factors, and to learn how to improve team interaction. We will finalize this training module this year. We will extend the training module by providing different exercises for each factor in MIRROR or for a group of factors. Also, we want to apply the training to crisis teams to be able to improve the training. We expect MIRROR and the 'MIRROR reflection module' to be a useful tool for team members of crisis teams, including liaisons of external parties. In addition, MIRROR has the advantage that it can be applied in non-crisis meetings as well. This enlarges the chances for potential team members of crisis teams to increase their team interactions skills. In the following year we will extend the training with exercises that can be used in non-crisis settings. Also, it is interesting to invest to what extend the overview is applicable to crisis teams in different settings, like crisis teams on national and international level and to crisis teams in high risk organizations, like a chemical plant.

ACKNOWLEDGMENTS

REFERENCES

1. Arkes, H.R., & Blumer, C. (1985). The psychology of sunk cost. *Organizational Behavior and Human Decision Processes, 35,* 124-140.

2. Costa, A.C., Roe, R,A., Taillieu, T. (2001). Trust within teams: The relation with performance effectiveness. *European Journal of Work and Organizational Psychology*, *10*(3), 225-244.

3. Capgemini. (2008), Evaluatie oefening Voyager: Een systeemevaluatie van kritische processen bij crisisbeheersing, Capgemini, Utrecht.

4. Crichton, M.T., Ramsay, C.G. and Kelly, T. (2009). Enhancing Organizational Resilience Through Emergency Planning: Learning from Cross-Sectoral Lessons. *Journal of Contingencies and Crisis Management, 17*(1), 24-37.

5. Helsloot, I. (2005), 'Bordering on Reality: Findings on the Bonfire Crisis Management Simulation', *Journal of Contingencies and Crisis Management, 13*(4), 159-169.

6. Jackson, S.E., May, K.E. & Whitney, K. (1995). Dynamics of diversity in decision making teams. In Guzzo, R.A. & E. Salas (eds). *Team Decision Making Effectiveness in Organizations*. San Francisco: Jossey-Bass.

7. Judge, T.A., Piccolo, R.F., & Ilies, R. (2004). The forgotten ones? The validity of consideration and initiating structure in leadership research. *Journal of Applied Psychology*, *89*, 36-51.

8. Levine, J. M., & Moreland, R. L. (1990). Progress in small group research. *Annual Review of Psychology, 41,* 585-634.

9. Malone, T.W., & Crowston, K. (1994). The interdisciplinary study of coordination. *ACM Computing Surveys, 26*(1), 87-119.

10. Paton, D. and Flin, R. (199). Disaster Stress: an emergency management perspective. *Disaster Prevention and Management*, *8*(4), 261– 267.

11. Schaller, M., Conway, L. G., III, & Tanchuk, T. L. (2002). Selective pressures on the once and future contents of ethnic stereotypes: Effects of the communicability of traits. Journal of Personality and Social Psychology, 82, 861–877.

12. Swezey, R.W., Salas, E. (1992). Teams: Their Training and Performance. Ablex Publishing Corporation, Norwood, New Jersey.

13. Turner, M., & Pratkanis, A. (1998). "Twenty five years of groupthink research". *Organizational Behavior and Human Decision Processes*, *73*(2), 105–115.

14. Waugh , W.L. Streib, G. (2006). Collaboration and Leadership for Effective Emergency Management. Special issue, *Public Administration Review, 66*, 131 – 40.