Inter-organizational cooperation: challenges for joint action

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A B S T R A C T

This paper investigates the challenges of inter-organizational cooperation, understood here as the fulfillment of joint tasks. The focus is on challenges or constraints influencing the quality of actions, the performance and, in consequence, the outcome of efforts for the organizations involved.

Findings suggest shortcomings on the organizational and the individual level and in different domains: psychological, technical, linguistic, and cognitive. Improvements are suggested that could help to reduce the number of challenging factors and thus their negative impact onto joint efforts.

Keywords: Cooperation, Decision-Making, Human Factors, Preparedness, Psychological Requirements,

I N T R O D U C T I O N

CONTEXT

The quality of inter-organizational cooperation is an important factor for successful management of large-scale critical situations like pandemics, soccer world cups, terror attacks, or natural disasters. Yet, there is little knowledge of the specific requirements of inter-organizational cooperation in the field of safety research.

In this paper we analyze some of the challenges of inter-organizational cooperation. These are clearly visible in major exercises for catastrophes, or in consequence of real disasters. Here, police, fire departments, rescue services, civil authorities, and others have to co-operate closely while working within different legal and cultural frames, with different priorities. The different general strategies, leadership concepts and conventions of organizations for internal communication may collide.
In order to manage large scale events successfully, organizations need to focus on shared concepts and strategies. Working together for the first time in the face of a catastrophe will most likely not be successful. The level of preparedness for disaster management in an inter-organizational context will furthermore determine the quality of joint action.

This paper aims at capturing some challenges for inter-organizational cooperation. This is done on both the organizational level and on the level of the individual. With respect to the organization, different factors are identified that are part of the specific "organizational culture". The organizational background defines the norms and different roles its members will act out intuitively. On an individual level, psychological requirements for humans acting under the conditions of crisis situations are identified.

Erschienen in W. Karwowski & G. Salvendy (Ed.), Conference Proceedings Applied Human Factors and Ergonomics International Conference 2010, Miami, 17.-20. Juli 2010. USA Publishing.

BACKGROUND

OrGaMIR, a joint research project funded by the German Federal Ministry for Education and Research, concentrates on the domain of public transportation where emergencies potentially affect large numbers of passengers and adjacent edifice. The acronym stands for "Cross-organizational hazard prevention to protect human life and critical infrastructures by optimized prevention and reaction".

The focus is on crisis management in major accidents and acts of terrorism involving toxic substances. The ultimate goal of this project is an integrated system for evaluating the present and expected contamination of underground systems with hazardous substances by means of substance detection and analysis, the calculation of the spread of such substances, and the targeted dissemination of consolidated, context-sensitive information to all organizations involved. Once the spreading behavior is known, targeted commands and information for passengers, rescue personnel and operators can be provided. All players can take decisions, which might save lives, on a more reliable basis. Another goal is to optimize the cooperation between fire brigades, rescue personnel and underground railway operators. The development of the system is complemented by the consistent integration of psychological aspects, such as information processing and decision-making under stress.

In opposition to e.g. fire fighters, the police or other public institutions, public transportation is not a domain whose core competence lies in the field of crisis response. Within this context, the authors' psychological project deals mainly with the analysis of intra- and inter-organizational cooperation and communication in emergency and crisis situations. Of special importance here is the coordination of the transport agency with professional crisis response organizations. A second focus is the investigation of individual actions in critical situations.

METHOD

Field data were gathered since 2008. Besides participant observations in regular operations and emergency exercises these consisted of several interviews with members of police, urban fire departments, rescue services and civil authorities. Additionally, in depth analyses of documents of each organization and three workshops with some of these organizations allow for insights in procedures, action requirements and behavior. Furthermore, an analysis of regional catastrophes, were military aid was summoned for their manpower or special abilities and our observations during a German national catastrophe exercise, LÜKEX, in January 2010 revealed different dynamics of situations where different organizations had to cooperate closely.
Following standards of qualitative social research, a triangulation of methods (Mayring, 2000; Taylor and Bogdan, 1998) was chosen. A combination of document analysis, expert interviews, and observations were the basis for detailed knowledge of emergency procedures. Furthermore, (large scale) exercises were observed to identify psychological requirements and the realization of plans for crisis management, actual action requirements, reporting channels, and the flow of information. Some of the findings are presented and some aspects are discussed here.

INDIVIDUAL PSYCHOLOGICAL DEMANDS IN DISASTERS

We quite often found professional staff involved in exercises to be unable to manage crises in a consistent and coordinated manner. Various reports of real disasters contribute to this finding. Professional training apparently lacks certain elements to enable staff to adequately respond to a crisis. Quite often psychological requirements play a minor role in training, or are neglected at all. Yet, psychological constraints determine to a large extent the options for decisions and actions of a human being (Hofinger, 2009).

From a psychological perspective, disasters and emergencies share some features. They start suddenly and often due to some external event, they are highly dynamic, and are a severe threat to life or the health of many people - emergency responders on-site and adjacent personnel alike (Heath and O´Hair, 2009; Bojn, 2008). Most importantly, this type of event also puts emotional and sometimes ethical burdens on those dealing with it.

In recent years, the challenges of such situations have been framed within the context of "human factors". In this paper we want to complement this approach with theoretical notions taken from research on complex problem solving under time pressure (Dörner, 1996; Frensch and Funke, 1995, Dörner and Schaub, 1994; Strohschneider, 2007) and "naturalistic decision making" (Todd and Gigerenzer, 2001; Zsambok and Klein, 1997; Klein et al., 1993).

PSYCHOLOGICAL CHARACTERISTICS OF DISASTERS

All disasters share certain features which have psychological consequences for the individual in charge of action. One of them is the general threat for life and health, the environment, or other important goods. In this situation the need for action is high – while not acting is usually not an option. A high level of importance increases the stress level because of the anticipated consequences of wrong decisions. Stress has limiting effects on the individual´s cognitive capabilities, in consequence fostering the probability for suboptimal decisions: „Ambiguity of cause, effect, and means of resolution […] will lead to disillusionment or loss of psychic and shared meaning, as well as to the shattering of commonly held beliefs and values and individual´s basic assumptions." (Pearson and Clair, Reframing crisis management, in Bojn, 2008, p. 10)

Further characteristics of disasters and their psychological consequences are listed below:

- high dynamics of the situation leading to time pressure – Decisions have to be made quickly and the situation may change while responders are busy thinking. Time pressure easily leads to a lack of action control and adds to the individual stress level (Dörner, 1996).
- uniqueness of the situation – Even with the best emergency plans there will always be features of the situation that have not been planned for. This uniqueness brings a need for problem-solving and decision-making, but these cognitive activities are slow and easily impaired by stress and anxiety.
- uncertainty, meaning that not all aspects of the situation are known – This may be due to a lack of data or due to lack of time for processing the data available. Also, the reliability of information is often disputable. Decisions have to be taken without an adequate basis of information. However, not knowing enough contradicts the human need for control and thus leads to uncertainty (Dörner, 1996; Langer, 1983; Glasser, 1986).
- alternating phases of information overflow and a lack of urgently needed information – While basic features of the situation may still be uncertain, messages, status reports and other bits of information keep coming in. This information must be prioritized and evaluated constantly, while the individual's ability to take in new information is diminished due to stress.

All these features of disasters add to stress due to the threat to the individual's life, health, or feeling of competence (Lazarus, 1999; Dörner 1996). The typical stress reaction is a "fight or flight" tendency which means that the organism is prepared for quick and strong action. This tendency impairs the rather slow processes of conscious thinking and problem-solving. Analysis – weighing different options for action, asking critical questions – is nearly impossible while a strong tendency towards "ad-hocism" (Dörner, 1996) – a type of "acting now simply to do something at all" – can be observed.

The most crucial consequence of stress is the diminishing of the cognitive capabilities of the individual (Badke-Schaub et al., 2008). This causes a switching into a mode of acting strictly according to well rehearsed routines, as they are provided by the organizational cultural frame. At the same time this reduces the willingness and the ability to flexibly adapt one´s own way of acting to the needs of members from other organizations. This in return reduces the chances for a shared mental model as the basis for well coordinated and successful joint efforts.

SKILLS NEEDED IN INTER-ORGANIZATIONAL DISASTER RESPONSE

If organizations are to work together, it is important that their members acting together on site are not constrained by the psychological mechanisms described above. Of course, situational demands are different depending on the role and task of the individuals from different organizations. Yet, they need skills beyond technical, domain specific knowledge known as "non-technical skills" (e.g. Flin et al., 2008). In aviation, their importance has been acknowledged for more than 20 years under the label of Crew Resource Management (e.g. Salas et al, 2006).

Non-technical skills in disaster management are generic competencies in the fields of problem-solving, strategic thinking, and communication and team management (Strohschneider, 2008). The term "generic" indicates that these skills can be applied to any structurally similar situation regardless of situational factors.

Some of the most important are briefly explained for the context of inter-organizational cooperation. As a first one, the ability to build strategic and tactical goals includes the weighing of importance and identifying the different options the different professional backgrounds offer. The ability to prioritize tasks refers to the need to select single problems a team can handle within a certain amount of time.

The ability to maintain situation awareness (e.g. Endsley, 1995) at all times is closely connected to the notion of shared

mental models, and includes the anticipation of a development of a given situation in order pick the right organizations with distinct abilities. The ability to flexibly adapt plans and procedures to the actual situation includes paying attention to the needs of organizations involved (McMaster and Baber, 2009; Borodzicz, 2004). Also crucial is the ability to take information in quickly, to assess their importance for the different organizations, and to distribute them accordingly.

Team members need to be able to decide according to their insight on site (local allocation of competence, e.g. Weick and Sutcliffe, 2007). In order to avoid a state of unreflected abiding by organizational routines, the insight into one's own reaction to stress and an ability to cope with emotion and pressure is indispensable (e.g. Zinke et al., 2009). This last aspect is arguably one of the most important abilities in order to prevent one´s own actions to become impenetrable for other organization´s members seeking interaction.

INTER-ORGANIZATIONAL COOPERATION

FEATURES

In the face of a large scale event, there is always a need for the cooperation and support of organizations like police, fire departments, or local governments. The scale of impact of an event, together with the rapidness of change, determine the level of urgency for inter-organizational cooperation and for the subsequent intensity of coordination throughout joint action.

Inter-organizational cooperation shares many features with "normal" team work. Among the individuals involved we (ideally) find shared goals, a general need for cooperation and for communication. With respect to these aspects, the motivation to work for the common goal and the willingness to share resources is essential for successful teamwork.

But there are also some additional attributes to inter-organizational cooperation (Hofinger, 2009). The contents and form of the cooperation have to be negotiated first. We find different cultures in the home organizations determining the standard habits and procedures according to which team members will act. We find the constraints of incongruent professional knowledge and different resources in the teams cooperating. We also find additional interfaces due to communication within and among the home organizations.

CHALLENGES AND PROBLEMS

As for the technical skills, our empirical analyses showed usually acceptable performance in crisis situations. Yet, where the basic assumptions – the goals and values – differed, the team-work remained rudimentary. This was, for example, the case for the assumptions on the sources of success: Many of the fire fighters we interviewed focused on teamwork and professional training as a source of success, while rescue service crews working with them focused more on individual performance and motivation.

The available literature points to further problems that impair the outcome of inter-organizational cooperation (McMaster and Baber, 2009; Sloper, 2004; Paris et al., 2000). Even though the general goal might be to provide the optimum level of support to people that are wounded or affected, the organizations cooperating often have contrary goals. Among teams the priorities of tasks often remain unclear; what is done first is often the result of ad hoc decisions by changing team members (e.g. Strohschneider, 2007). This is connected to the next problem: unclear roles and responsibilities. The lack of commitment to the cooperation by the leaders and the resulting hindered free flowing of information is a further problem (e.g. Schein, 2004). The diverging structures of home organizations and the lack of training in cooperation with personnel from other domains are also often found (Hofinger, 2008).

MAKING IT WORK

These observations indicate a strong influence of the organizational frame on team work, communication and the willingness to cooperate. Positive impact on smoothly coordinated joint action can be expected from the following factors, we derived from the analyses of interviews which seem to be in accordance with the literature.

Crucial aspects for successful inter-organizational cooperation and team-management seem to be, first, shared goals and priorities that are clearly communicated. Secondly, knowledge about general goals, culture and general conditions of all other organizations is necessary. Third, the motivation to cooperate and share emotional bonding to the other team-members improve team performance (e.g. Kapucu, 2008). Fourth, viable ways of sharing information have to be given or installed (e.g. Horn and Strohschneider, 2005; Hofinger, 2005) regardless of an often found mismatch between technical systems. Fifth, interoperability of resources has to be secured, ideally in advance to a joint task. Sixth, a certain flexibility of structures and roles must be given within the constraints of the organizational cultures (e.g. McMaster and Baber, 2009). Seventh, a "unity of command" (Sloper, 2004), e.g. an assigned leader in charge who can delegate tasks is necessary (e.g. Buerschaper and Starke, 2008; Paris et al., 2000).

A universal condition for success in critical situations seems to be the existence of a shared mental model that is regularly updated among the organizations and personnel involved. Shared mental models include a shared knowledge, interpretation and understanding of the tasks at hand, of the roles and responsibilities of all team members, and the general options for action in a given situation. (e.g. Lim and Klein, 2004; Stout et al., 1999; Cannon-Bowers and Salas, 2001). This is especially true when continuous communication – using a commonly understood linguistic code, e.g. acronyms or terminology – is not possible and every team member acts alone for some time. All the factors listed above are prerequisites for the establishment of a shared mental model and thus for a smooth coordination of joint action in inter-organizational team cooperation.

CONSEQUENCES AND CONCLUSIONS

Summarizing our findings, problem-solving, effective decision-making and taking command, based upon a shared mental model, are the most critical aspects in successful inter-organizational joint action in crisis management. These are influenced by emotional and physical conditions and by basic psychological mechanisms of self-regulation. Situational requirements colliding with psychological and human characteristics are a main source of inadequate behavior in crisis situations.

Training of staff must include psychological aspects of crisis management and their routine tasks alike. In order to prepare staff for the requirements of joint action in crisis response, training-programs – ideally inter-organizational – should include role-specific technical skills and the training of generic competencies alike. This can contribute to an increase in awareness for organizational cultural differences, that most often are the reason for suboptimal joint actions.

Above all, inter-organizational communication was identified as the key to building a shared mental model among all individuals acting on site. Thus, knowledge of the general strategy for action and the communicative standards of other organizations have to be taught. Acting together should to be practiced regularly and it should result in common rules of engagement – to use a military term.

REFERENCES

Badke-Schaub, P., Hofinger, G., and Lauche K. (Eds.) (2008), *Human Factors: Psychologie sicheren Handelns in Risikobranchen* [Human Factors. Psychology of safety in high-risk domains], Heidelberg, Springer.

Bojn, A. (ed.) (2008), *Crisis Management. Volume II*, Los Angeles et al., Sage Publications Ltd..

Borodzicz, E.P. (2004), "The missing ingredient is the value of flexibility." *Simulation & Gaming*, 35, 414-426.

Buerschaper, C. and Starke, S. (Eds.) (2008), *Führung und Teamarbeit in kritischen Situationen* [Leadership and team work in critical situations], Frankfurt am Main (Germany), Verlag für Polizeiwissenschaft.

Cannon-Bowers, J. A. and Salas, E. (2001), "Reflections on shared cognition." *Journal of Organizational Behavior*, 22, 195-202.

Dörner, D. (1996), *The logic of failure: Recognizing and avoiding error in complex situations*, New York, Metropolitan Books.

Dörner, D. and Schaub, H. (1994), "Errors in planning and decision making and the nature of human information processing." *Applied Psychology: An International Review*, 433-453.

Endsley, M. R. (1995), "Toward a Theory of Situation Awareness in Dynamic Systems." *Human Factors*, 37, 32-64.

Flin, R., O'Connor, P., and Crichton, M (Eds.) (2008), *Safety at the sharp end: A guide to non-technical skills.* Aldershot, Ashgate.

Frensch, P.A. and Funke, J. (Eds.) (1995*), Complex Problem Solving. The European Perspective.* New York NJ, Lawrence Erlbaum Associates.

Glasser, W. (1986), *Control theory in the classroom*, New York, Harper and Row.

Heath, R.L. and O`Hair, D. (Eds.) (2009), *Handbook of risk and crisis communication*, London, Routledge.

Hofinger, G. (2009), Kritische Faktoren der interorganisationalen Zusammenarbeit [Critical factors of inter-organizational cooperation]. In Strohschneider, S. and R. Heimann (Eds.), *Kultur und Handeln* [Culture and safety], Frankfurt am Main (Germany), Verlag für Polizeiwissenschaft, 189-203.

Hofinger, G. (2008), Teamtrainings für Krisenbewältigung [Training teams for crisis management]. In C. Buerschaper and S. Starke (Eds.), Team und Führung in kritischen Situationen [Teams and leadership in critical situations]. Frankfurt am Main (Germany), Verlag für Polizeiwissenschaft, 190-205.

Hofinger, G. (Ed.) (2005), *Kommunikation in kritischen Situationen.* [Communication in critical situations], Frankfurt am Main (Germany), Verlag für Polizeiwissenschaft.

Kapucu, N. (2008), "Collaborative emergency management: better community organising, better public preparedness and response." *Disasters*, 32**,** 239-262.

Klein, G., Orasanu, J., Calderwood, R., and Zsambok, C.E. (1993), *Decision making in action: Models and methods.* Ablex Publishing Co., Norwood, NJ.

Langer, J.E. (1983), *The Psychology of Control*, Beverly Hills, CA, Sage Publications.

Lazarus, R.S. (1999), *Stress and Emotion*, London, Free Association Books.

Lim, B.-C. and Klein, K. J. (2004), *Team Mental Models and Team Performance: A Field Study of the Effects of Team Mental Model Similarity and Accuracy*, Pennsylvania/ Singapore, University of Pennsylvania/ Ministry of Defense Singapore. (Available: http://www.internationalmta.org/Documents/2004/ 2004062P.pdf [accessed in August, 2009]).

McMaster, R. and C. Baber (2009), Multi-Agency Operations: Cooperation during flooding. In D. de Waard, H. Godthelp, F. Kooi, and K. Brookhuis (Eds.), *Human Factors, Security and Safety*, Maastricht, Shaker, 13-28.

Paris, C. R., Salas, E., and Cannon-Bowers, J. A. (2000), "Teamwork in multi-person systems: Á review and analysis." *Ergonomics*, 43 (8), 1052-1075.

Schein, Edgar H.(2004), *Organizational Culture and Leadership*, 3rd edition. New York, Wiley Publishers.

Sloper, P. (2004), "Facilitators and barriers for coordinated multi-agency services." *Child: Care, Health & Development*, 30 (6), 571-580.

Salas, E., Wilson, K. A, Burke, C. S., and Wightman, D.C. (2006), "Does Crew Resource Management Training Work? An Update, an Extension, and Some Critical Needs." *Human Factors*, 48 (2), 392-412.

Strohschneider, S. (2008), Human Factors Training, in: Badke-Schaub, P, Hofinger, G., and Lauche, K (Eds.), *Human Factors: Psychologie sicheren Handelns in Hochrisikobranchen* [Human Factors: Psychology of safe behavior in high-risk domains], Heidelberg, Springer Verlag, 289-306.

Strohschneider, S. (2007), *Entscheiden in kritischen Situationen* [Decision making in critical situations], 2nd edition, Frankfurt am Main (Germany), Verlag für Polizeiwissenschaft.

Stout, R. J., Cannon-Bowers, J. A., Salas, E., and Milanovich, D. M. (1999). "Planning, shared mental models, and coordinated performance: An empirical link is established." *Human Factors*, 41 (1), 61-71.

Taylor, Steven J. and Bogdan, Robert (1998), *Introduction to qualitative research methods: A guidebook and resource*, 3rd edition, Hoboken, NJ, US, John Wiley & Sons Inc.

Todd, P. and Gigerenzer, G. (2001), "Putting Naturalistic Decision Making into the Adaptive Toolbox." *Journal of Behavioral Decision Making*, 14, 353-384.

Weick, K. and Sutcliffe, K. M. (2007), *Managing the unexpected: Resilient Performance in an Age of Uncertainty*. 2nd edition, San Francisco, Wiley.

Zinke, R., Hofinger, G, and Strohschneider, S. (2009), "Requirements of crisis situations - an action psychology perspective." *Human factors: a system view of human, technology and organization.* Conference proceedings of the annual meeting of the HFES Europe Chapter, Linköping, SE.

Zsambok, C.E. and Klein, G. (1997), *Naturalistic Decision Making*. Lawrence Erlbaum Associates, Mahwah, NJ.