Summary in English

Although the perspective on organizations as open systems, has been known for decades, the consequences of this perspective has hardly been investigated. Organizations from the perspective of open systems, are characterized as self-organizing complex systems in which nonlinear processes determine the outcome. Nonlinearity in this respect means that there is no clear relation between cause and effect, a similar change can result in a variety of outcomes. A consequence of the nonlinear processes in organizations is that the outcomes of interventions cannot be predicted. Therefore, the perspective of organizations as open systems is regarded as a perspective without intervention strategies. In our study we will challenge this believe. By obtaining more insight in the dynamics of emerging processes and the factors that influence emergence it will be possible to design intervention strategies for nonlinear processes and to define the limits of what can be achieved with such interventions.

In our studies we focused on attitude formation in organizations. Attitudes are important because they are a major predictor of behavior. It is further demonstrated that a positive attitude towards an organizational change is a prerequisite for a successful organizational change. However, although attitudes can be measured relatively easily, to study the emergence of a shared attitude empirically in real life organizations is nearly impossible. To study emergence empirically, all interactions between all employees have to be monitored and scored during a period of time. And when the influence of organizational factors on this process needs to be determined, such a study has be done in a large number of organizations. Since these hurdles cannot be overcome, we used computer simulation. The computer model we used belongs to the category of the agent-based models. In our model every agent has a decision rule. Based on the interactions with other agents and organizational factors this decision rule determines whether an agent will keep its current attitude or change it. Due to the multiple interactions between the agents in the model, a stable pattern of attitude emerges with a majority that can be regarded as the organizational shared
attitude. The larger the group supporting the preferred attitude, the more successful the change. With the data gathered during various rounds of interactions we were able to assess the influences of the following organizational factors on the outcome: the level of authority within the organization, the communication densities within groups, departments and the organization, the level of organizational persuasion and the level of group commitment within the organization.

In our model authority enhanced the personal influence of superiors. The level of communication densities determined the frequency in which employees interacted with each other regarding the attitude. The level of organizational persuasion was defined as the sum of all motivators and de-motivators in the organization regarding the attitude. The organizational persuasion always supported the preferred attitude and thus reduced the personal resistance to change one’s attitude when this attitude was opposing the preferred attitude and it strengthened the resistance to change one’s attitude when it matched the preferred attitude. The level of group commitment determined the pressure that individuals experienced to conform themselves to the majority attitude in the group. In our simulations we tested how each of these parameters enhanced or inhibited the influence of the CEO on the outcome of a shared attitude.

In our first study, we simulated a situation in which, from a random pattern of attitudes, a shared attitude emerged. This simulation therefore, resembled a reaction to a jolt in which an unexpected environmental change occurred that made it necessary to develop an organizational shared answer. In this first study we assessed the dynamics and the general features of the model. It was demonstrated that all virtual organizations indeed self-organized. In all organizations a stable pattern of attitude was formed in which a majority attitude and minority attitude could be defined. The process of attitude formation was shown to be very fast. Most attitude changes took place during the first interaction round and decreased rapidly in the next few iterations. After iteration 5, only a few attitude changes per iteration were observed. Nonlinearity was demonstrated by two features. First, the starting conditions were shown to be hardly predictive for the outcome. Second, when we allowed identical organizations with identical agents to repeatedly go through the process
of attitude formation, a range of outcomes was found, showing that similar starting conditions generated a variety of outcomes. An important observation was that although the starting conditions were not predictive for the outcome, the outcome of the first iteration was highly predictive. It was demonstrated that the outcome of the first iteration in almost all cases determined the final outcome. This observation indicates that after the first iteration little can be done to change the course set in during this first iteration. As a consequence, to influence emerging processes one can only influence the outcome very early in the process.

From the same set of simulations we assessed whether management was able to influence the emergence of a shared attitude and which organizational factors would enhance this influence. We were able to demonstrate that management indeed could influence the emergence of a shared attitude. The influence of the CEO was shown to be predominantly enhanced by the level of organizational persuasion. The dominant strength of organizational persuasion on the influence of the CEO demonstrates the importance of lowering the resistance against a change. In addition the influence of the CEO was further enhanced by the alignment of the departmental heads, demonstrating the importance of a strong coalition.

In the second set of simulations we studied adaption and escalation of commitment. In this simulation a majority attitude was established first, then the environment changed and it became clear to all agents that the behavior associated with the old attitude was failing. This realization was simulated by lowering the resistance to change the old attitude in favor of the new attitude during each following iteration. Because of this, all agents in the system became very susceptible to change their attitude towards the new attitude However, despite the “willingness” of each agent to change its attitude, escalation of commitment still occurred in 16% of the organizations. The simulation further demonstrated that adaption was stimulated only by the level of communication in the organization. Escalation of commitment was caused by too homogeneous organizations. Due to the high homogeneity, agents interacted insufficiently with agents having the new attitude because they were stuck in rounds of mutual conformation and thus unable to change.
In our third set of simulations we assessed the role of the post-intervention phase on the long-term success of an intervention. As common practice in organizational changes, the attitudes of employees were changed by means of an intervention. However, due to the nonlinearity of the process of self-organization during the post-intervention phase it is uncertain how the results of the intervention will further develop. We found that all results obtained during the intervention phase were modified during the post-intervention phase. This modification indeed caused that similar outcomes of an intervention resulted in a variety of outcomes at the end of the post-intervention phase. This finding yields further insights as to why so many organizational changes fail and that the uncertainty regarding the outcome of interventions is intrinsic to organizations being complex systems.

Based on our data we were able to identify some factors that may enhance the chance of success of intervention strategies. During the pre-intervention phase the size of the minority attitude present in the organizations had a positive effect. During the intervention, the final number of employees with a new attitude at the end of the intervention phase was positively correlated with the long term success of an organizational change. Especially the number of departmental heads that had obtained the preferred attitude during the intervention, was shown to be quite important for the long term outcome. During the post-intervention phase the level of organizational persuasion towards the new attitude was by far the most important organizational factor to obtain a successful change. Due to the fact that the organizational persuasion is determined by a large number of factors in the organization, it can be concluded that change models that emphasizes the necessity to adjust the organization at all levels in order to implement a change, will be the most effective.

By using computer simulations we were thus able to connect the micro level decisions made by individuals with the macro level of a shared organization behavior. With this model we gained more insight into the emergence of a shared attitude in organizations, how to change this attitude and how to influence its emergence. Based on these insights, from the perspective of organizations
as open systems, we were able to identify strategies that are able to reduce the intrinsic uncertainty associated with organizational changes.

Our contribution to the organizational change literature is that we were able to slightly open the black box of emergence. Emerging processes were always regarded as being autonomous and uncontrollable and thus beyond the influence of management. With our model we however demonstrated that management has the means to influence emerging processes and we were able to provide strategies that can enhance the influence of management on the emergence of a shared attitude. Nevertheless, in all simulations an intrinsic level of uncertainty regarding the outcome remained; similar efforts could always lead to different results.