

Leading improvisation in new product development teams: A theatrical experiment

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Abstract

Improvisation in an organizational context requires leadership to solve the paradox between freedom and control. In this research, three leadership styles, directive, servant and rotating leadership, are studied to see how they deal with this context and how they affect the quality of improvisation. A novel research method, theatrical simulation, where performers simulate social processes, allows for in-depth analysis leadership. Our results are that rotating leadership works best, but can go horribly wrong at the same time; servant leadership is quite beneficial and that directive leadership works surprisingly well when coupled with positive feedback.

Keywords: Improvisation, New product development, Leadership, Theatrical simulation.

1. Introduction

In the literature on new product development, there is a growing attention for organizational improvisation. Improvisation - defined as the ‘conception of action as it unfolds...drawing on available material, cognitive, and social resources (Pina e Cunha, Vieira da Cunha, & Kamoche, 1999, p.302)’ – allows NPD-teams to come up with novelty in situations of uncertainty, ambiguity, and time pressure. Especially in times of rapid environmental change and technological turbulence, the capability to improvise is crucial (Weick, 1993a). Organizational improvisation makes it possible to react to events immediately and creatively, without careful and lengthy planning.

In the literature on organizational improvisation, theatrical and jazz improvisation have served as the main metaphors and sources of inspiration (Bastien & Hostager, 1988; K Kamoche & Pina e Cunha, 2001; Dusya Vera & Crossan, 2004). A major difference between improvisation in organizational settings and improvisation on stage, though, is that in organizations, improvisation is focused outcomes and solutions to problems, while on stage, the process itself – acting or playing spontaneously – is most important. This creates a paradox for organizational improvisation, a paradox between freedom and control (Pina e Cunha, Kamoche, & Campos e Cunha, 2003). Members of NPD teams need freedom to improvise, but the process needs control in order to reach the desired outcomes (Amabile, 1997). Because of this paradox, leadership is a crucial element in organizational improvisation (Vera & Rodriguez-Lopez, 2007).

The relationship between leadership – especially leadership style – and improvisation has been discussed by several authors (Cunha & Da Cunha, 2003; Pina e Cunha et al., 1999; D. Vera & Rodriguez-Lopez, 2007) Servant leadership – in which the leader is primarily concerned with facilitating team members to achieve organizational goals – and rotating leadership – in which the leadership role shifts depending on the problem at hand and the dynamics of the process – are considered beneficial for improvisation. Directive leadership,

on the other hand, is considered to be too control oriented and thus detrimental for improvisation. However, empirical evidence on this relationship is scarce. The purpose of this paper is to test the assumptions about the relationship between leadership style and organizational improvisation and to investigate the influence of leadership more closely.

For this purpose, we conducted a theatrical experiment. Theatrical experimentation is a novel research method, in which real life situations are simulated on stage, allowing for isolation, magnification, manipulation, and condensation of the studied process (Wagenaar, 2008). We designed a new product development task, for which we employed improvisational performers and created the optimal conditions for improvisation. In the experiment, we varied the leadership style and attitude of the leaders in twelve different simulations. Afterwards, independent judges assessed the quality of the improvisation process and the outcomes.

The experiments show – as was expected – that directive leadership normally has a negative impact on organizational improvisation. Servant leadership and especially rotating leadership are more beneficial for improvisation. However, when directive leadership is combined with a positive, stimulating attitude, the improvisation quality surpasses the level of servant leadership and almost equals the quality of the rotating leadership style. Furthermore, rotating leadership proves to be fragile. If teamwork falters, there is no mechanism to bring the team members on track, which has a negative impact on improvisation quality.

The paper is structured as follows. In the theoretical framework, we will discuss organizational improvisation, its antecedents, and the influence of leadership style. After that, the research method and results will be presented. To conclude, we will discuss the theoretical and practical implications, as well as the limitations of this study.

1.1. Theoretical framework

Improvisation is creative action. It is “the spontaneous and creative process of attempting to achieve an objective in a new way” (Vera and Crossan 2004, p.733). Spontaneous means that the process is not planned or elaborated beforehand, but that the action unfolds, and that the conception of what to do and the action itself occur simultaneously (Pina e Cunha et al., 1999). Improvisation is related to the concept of bricolage, making do with the materials at hand (Baker, Miner, & Eesley, 2003; Levi-Strauss, 1966; Weick, 1993a). Improvisers draw on available materials, but where bricolage focuses attention to the scarcity, heterogeneity, and flexibility of the resource base (Baker & Nelson, 2005), improvisation focuses on the creative process of the tinkering itself. Another concept closely related to improvisation is reflection-in-action (Schön, 1983, 1987), the notion of creative action as a cyclical problem solving process, containing intuitive explorations, experiments, and reappraisals of the situation when unexpected events occur (Visscher & Fisscher, 2009). Improvisation involves the same cycle of action, reflection, and reframing, but lays emphasis on the speed and concurrence of the activities. In this study, we will define improvisation as spontaneous, rapid and creative problem solving, characterized by concurrent planning, action and reflection, while using the resources at hand.

1.2. Antecedents of improvisation

Improvisation usually occurs when there is an unexpected mismatch between the expected and perceived reality. This mismatch can be caused by environmental conditions such as turbulence, complexity and time-pressure (Crossan, Pina e Cunha, Vera, & Vieira da Cunha,

2005; Pina e Cunha et al., 1999; D. Vera & Crossan, 2005). These conditions lead to feelings of uncertainty and ambiguity, and to a sense of urgency, which trigger improvisation. Uncertainty forces people to deal with information as it comes in, while ambiguity entails a surplus of possible choices, which improvisation solves through action and concurrent sense-making (Schon, 1983; Weick, 1993b). A sense of urgency stimulates people to act immediately, without careful planning.

These conditions do not guarantee good improvisation, though. On the organizational level, three antecedents of good improvisation can be discerned: experimental culture, minimal structure, and real-time information. An experimental culture tolerates or even promotes competent mistakes (Johns & Storey, 1998), failures that are born out of novel ideas (Pina e Cunha et al. 2003). In an experimental culture, team members experience mutual trust and appreciation of each other's ideas and attempts to innovate (Johnstone 1987; Vera and Crossan 2004). Trust is very important for team improvisation, to foster that people will help each other during the process.

Besides, a minimal structure is required. This is a framework that nurtures the freedom to act. In jazz, the structure of a song is the framework wherein musicians can freely improvise (Barrett 1998). In theatrical improvisation, there are structures, called games, that provide a shared understanding of the possibilities, limitations and goal of the scene that is improvised (Johnstone 1987). In organizations, minimal structures can be achieved through invisible controls and clear goals (Brown & Eisenhardt, 1997). Invisible controls do not restrict the creativity and spontaneity of improvisation. Clear goals provide a sense of direction.

A third antecedent is the availability of real-time information (Moorman & Miner, 1998a; Dusya Vera & Crossan, 2004; D. Vera & Crossan, 2005). By having access to real-time information about the process, people can use input as it becomes available. It is important that team do not get an overflow of information, as this will distract them from the process.

At the team level, good team work and team stability are antecedents of good improvisation (Akgünn & Lynn, 2002). As stated above, mutual trust is important. If the composition of a team is relatively stable, trust has time to grow. Furthermore, team members need time to develop a 'feel' for each other, which means that they instinctively know how other team members will react. Especially the willingness to support each other's ideas and enhance them is important (Vera and Crossan 2004). In improvisational theatre this is called 'Yes-anding'. When a performer comes up with a new idea during a scene, the other performers accept this idea as true and build on it.

At the individual level, personal characteristics such as spontaneity, creativity, flexibility and intuitiveness are relevant antecedents (Pina e Cunha et al., 1999). These characteristics make it easier for a person to improvise well, although training can compensate for a lack of natural traits to a certain extent (Anderson, 2008). Having a broad, heterogeneous skill and knowledge base is also positive for improvisation (Hargadon & Sutton, 1997), as it facilitates the making of new combinations. Expertise, on the other hand, may hinder improvisation, as experts tend to fall back on known solutions (Kyriakopoulos, 2004; Leybourne, 2006).

Leadership is important for organizational improvisation, because it is instrumental to solve the paradox between freedom and control. They influence the organizational and team-level antecedents of improvisation, by setting goals, enacting minimal structures, fostering trust and teamwork, providing real-time information and feedback, and nurturing an experimental

culture. Leaders grant freedom for creativity and experimentation, while keeping ‘an eye on the prize’.

Servant leadership was first formulated by Greenleaf (1970). He emphasized that leaders should be servants first and leaders second. Servant leaders build credibility and trust and give service to their people (Farling et al. 1999). They fit the nineteenth century British prime-minister Benjamin Disraeli, who said “I must follow my people. Am I not their leader?” Servant leaders act like stewards; they are responsible for their people and the results they achieve, but they give them room to achieve these results on their own and support them by helping them with menial tasks and building a shared vision and commitment (Pina e Cunha et al. 1999). Furthermore, a servant leader contributes by asking the right questions, rather than by telling the right solutions.

Servant leadership deals with the paradox between freedom and control by giving people room, while exerting subtle control by asking questions, stating goals. Team members can focus on the tasks in which they excel and use their full creative potential. Together with the goal focus this is assumed to have a positive influence on the outcome of the improvisation. A servant leader also steers social interactions to foster team work protects his team members from an information overload, thus positively influencing the process of improvisation.

Hypothesis 1: Servant leadership has a positive effect on the quality of the improvisation process and outcome.

In a rotating leadership style, the team member who is most capable of handling a certain situation will become the leader. This means that there can be several subsequent leaders during a NPD process. Rotating leadership fits with improvisational processes, as it accommodates rapidly changing situations and the continuous shift of initiative (K. Kamoche, Cunha, & da Cunha, 2003; D. Vera & Rodriguez-Lopez, 2007). Rotating leadership solves the paradox between freedom and control by giving everyone full freedom while making them responsible for controlling the objective at the same time.

Rotating leadership is assumed to result in a high quality of improvisational outcomes because it mobilizes all team members to excel and reach the common goal. Under the right organizational, individual, and team level conditions, team members have the freedom to use their creative potential, build on each other’s input, and feel a shared responsibility to create a novel product. This also fosters the quality of the improvisation process.

Hypothesis 2: Rotating leadership has a positive effect on the quality of the improvisation process and outcome.

A third leadership style that can be assumed to have an impact on the quality of the improvisation is a directive leadership style. A directive leader makes the decisions himself and directs his followers to perform specific tasks (Bass and Bass 2008). The directive leader uses control to reach the objective of the organization without giving freedom to team members. It is hypothesized to have a negative effect on the process of improvisation. The quality of the outcome will also be low, because team members do not have the freedom nor the motivation to use their creative potential.

Hypothesis 3: Directive leadership has a negative effect on the quality of the improvisation process and outcome.

2. Methodology

The research method that we will use in this research is an unorthodox research method called *theatrical simulation in hyper reality*. A simulation entails abductive reasoning, with a focus on *what could be*, in contrast to inductive reasoning (what is) and deductive reasoning (what is supposed to be). Usually, simulation is done by computers, where a set of rules is programmed into a computer model and researchers adjust the variables they are researching in order to observe how the model reacts. This is normally done in two phases. First, the rules of the simulation, called microscopic rules, are tested to see whether the model reflects reality, or macroscopic behavior. If this is the case, the microscopic rules are considered correct. The second phase then consists of changing the conditions within the simulation to explore what could be (Fann, 1970; Paavola, 2005; Wagenaar, 2008).

Theatrical simulation follows the same phases as computer simulation, but it is done with theatrical performers instead of a computer (Wagenaar 2008). Computer simulations take place in an artificial reality that tries to mirror the concrete reality. Theatrical simulation takes place in a hyper reality that does not have to mirror concrete reality exactly, as long as it mirrors the relevant processes that do happen in the real world. Hyper reality enlarges those parts of the concrete reality a researcher is interested in.

Theatrical simulation allows for isolation, magnification, manipulation, and condensation of the studied process. Isolation is the ability to focus on one or more variables. In empirical research, variables often cannot be fully isolated, thus risking contamination from other variables. In theatrical settings, variables can be isolated and manipulated without this risk. Moreover, it is possible to manipulate factors that are normally hard to influence, such as personality and leadership style. Theatrical simulation also magnifies the studied process. This is because of the ‘dramatic necessity’ of the theater. Interesting interactions are played out and magnified by performers, while irrelevant or just boring actions are left out. This is also the basis for condensation. Theatrical simulation can show in fifteen minutes a process that would normally take several months.

The ‘dramatic necessity’ of the theater also brings a potential risk into this kind of simulation. It may seduce actors to shape situations in such a way that they are most entertaining. For instance, they may prefer a conflict situation over a peaceful situation, and a hero or a villain over a regular man or woman. This risk can be countered by giving good role instructions, and by giving them the same goals as the roles they play.

2.1. Modeling the simulation

A theatrical simulation model has to describe the (1) roles of the performers, (2) the relationship between the roles and (3) the environment in which the roles are played (Klabbers 1999). To enable improvisation, we translated all relevant antecedents of improvisation into the set-up of the theatrical simulation model.

As the setting of the simulation, we chose the guilds in the late middle ages of Western Europe. Such a simple historical context invokes a shared understanding for the performers. Within this setting the performers play guild masters, apprentices or abbots. The goal for the performers is to make an innovative product for their empress. They should design a product that meets two or more opposite requirements, such as a suit of armor that is light and womanly, but also protective and fierce. The empress is played by a director, who is present

next to the researcher to instruct the performers on a theatrical level. The request for a product is broadly formulated to mirror a minimal structure in a broad and clear goal.

The personal and inter-relational characteristics of the performers are also important. Most personal characteristics can be acted out by performers, but some, like spontaneity, creativity, flexibility and intuition cannot be faked. In our simulation, all performers have the necessary skills because they are experienced improv performers, who have trained these skills weekly for an average of 7.5 years. Team work and team stability also cannot be faked. As most of the performers know each other from the same improv club and are used to playing with varying people, we assume good team-level antecedents.

Important in determining what the performers can and cannot act are the limits of time and logic. In theatrical improvisation, all objects except chairs are mimed, which means that possibilities for products are only limited by imagination. In the simulation, the performers were instructed to limit their imagination to what is logical and feasible in a medieval environment. There is also a limitation in time, as every simulation takes approximately 20 minutes. These limitations are invisible controls, important elements of a minimal structure.

The wide array of options open for the performers provokes feelings of ambiguity, as they can choose among a lot of possibilities. Other feelings that originate from the environment are uncertainty and urgency. Both are evoked by a speech the empress gives at the start of the simulation. In table 1 the empress' speech and relevant factors are shown. The speech also serves to translate the antecedents of an experimental culture, promoting action, tolerating mistakes and building trust.

Phrase	Concept
You are my best people and I know you will make me proud.	Trust
I don't mind any mistakes, but you will have to give your best effort to the task.	Competent mistakes
The most important thing is to produce an actual product, not just plans.	Promote action
This assignment is very important to me and I will reward you greatly if you succeed within our limited time.	Urgency
I will check in on your progress several times during the process and possibly change the goal as I see fit.	Uncertainty

Table 1: Empress' speech

In order to increase turbulence and feelings of uncertainty even more, the so-called 'feedback command' is given by the researcher and director during simulations. This means that something goes wrong with whatever the performer that gets the command is doing. This command also presents a performer with real-time information.

In the simulation, we define the relationship between the directive leader and the team members as the relationship between a guild master and his apprentices. The guild master is a figure of power, who decides what needs to be done. The apprentices are expected to follow the instructions, but are knowledgeable enough to do things on their own. For servant leadership we have chosen an abbot to lead a team of guild masters. There is no apparent hierarchy between an abbot and a guild master, but they have a different focus. The abbot, as a spiritual person, has the perception of gentleness, which suits the servant leader. For rotating leadership, a team of four guild masters works together. One of the guild masters is appointed spokesman, but without any special powers. All characters will have the same hierarchical status and each guild master can choose his own expertise as he wants.

The actors who play the leaders are instructed on how to relate to their team. These are based on Bass' descriptive model of decision styles (Gill, 2006). For directive leadership, the behavior that leaders should show is: "letting subordinates know what they are expected to do, scheduling and coordinating work, giving specific guidance, and clarifying policies, rules, and procedures." (House 1996, p.326). For rotating leadership, the group is instructed to use their ideas immediately, regardless of their role. Servant leaders were instructed to play a game called 'only questions', which is well known in improvisational theatre. They should only speak to the team members in the form of questions. Besides, the leader is instructed to carry out menial tasks for the team members.

During the simulation, we observed that the performers portraying a directive leader only gave negative feedback to the team members, while servant leaders only acted positively. This fits with the theatrical stereotype of directive and servant leaders, which were enacted because of 'dramatic necessity'. To account for this, and to study the implications of different instantiations of the directive and servant leadership styles, we gave additional instructions to the actors, to change their feedback in the subsequent sessions. Directive leaders were instructed to give positive feedback, while servant leaders were told to ask critical, insinuating questions.

2.2. Data collection

For the research, a total of nine performers performed six sessions. Each session consisted of warming up exercises and two simulations. Every session was dedicated to one leadership style in the order 'directive – servant – rotating – *hiatus for analysis* – rotating – directive – servant'. To avoid bias by the performers, each performer played every leadership style only once.

The sessions were videotaped and transcribed for analysis. The judgment of the quality of the improvisation product and process was carried out by two observers. These had the same background as the performers, which is important for the assessment (some patterns and styles of improv differ between clubs). The observers scored both process and outcome quality on a five point scale, where a three represented a neutral stance towards the quality, four and five signified good quality, and one and two signified bad quality. They first scored independently, and if these were more than one point apart, they discussed and re-evaluated. This resulted in gave us an inter-observer reliability of 0.902 for process quality and 0.822 for product quality (Cronbach's Alphas).

To assess process quality, the observers were given a guideline containing four criteria based on a typology for successful theatrical improvisation (Dusya Vera & Crossan, 2004). These are given in table 3. As this is not a validated scale, these criteria were used as a guideline rather than as a detailed measurement instrument. The quality of the outcome was assessed by comparing the end product with the specifications articulated by the empress at the beginning of the simulation.

Factor	Operationalization
Agreement	The performers accept each other's suggestions
	The performers support each other during the simulation
	The performers build on each other's suggestions
Awareness	The performers know what the others are doing
	The performers focus on here and now instead of past or future actions

Use of Ready-mades	The performers combine existing notions into new ones
	The performers use known improvisational motifs
Collaboration	The performers do not begrudge each other successes
	The performers trust and respect each other
	The performers favor team performance above their own performance

Table 2: Guidelines for measuring process quality.

In the qualitative analysis of the video transcripts, the influence of the behavior of the leader on improvisation was studied more in-depth. We identify an action as improvisation if conception and execution occur simultaneously. There is a grey area of actions that could be termed improvisation, because conception and execution are very close to each other in time, but because of the condensation in time and the experience of the actors, we disregarded these events and only looked for instances of ‘pure’ improvisation. When analyzing the behavior of the leaders, special attention was given to how the performers perceived their freedom and the control of the leaders. This analysis was complemented by a series of group interviews with the actors, right after each session, in which these issues were thematized.

3. Results

The scores of the quality of the improvisation process and outcome are given in table 3. Sessions one through four all had the same instruction. In session five and six we varied the instruction to correct for the observed stereotypical behavior of the directive and servant leaders. In session 5a, the directive leader had to give positive feedback, while in session 6a the servant leader had to give negative feedback¹.

Simulation	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b
Leadership	Directive		Servant		Rotating		Rotating		Directive		Servant	
feedback	Negative		positive						Posi- tive	Nega- tive	Nega- tive	mixed
Process	1. 5	2.5	3.5	2.5	4	3.5	4	2	3.5	3	2.5	2.5
Product	4. 5	2	4	3.5	4.5	4.5	3	3.5	4.5	2	4.5	4

Table 3: Scores according to leadership style

The scores show that the directive leadership style score low on both process and product quality, with an average of 2.33 on process quality and 2.83 on product quality (disregarding the session with the additional instruction to give positive feedback). Servant leadership scores a bit better, with average scores of 3 on process and 3.75 on product quality (also disregarding the session with additional instructions). Rotating leadership gives the highest scores, with average scores of 3.38 on process and 3.88 on product quality.

Table 4 gives a comparison of the averages on the basis of a paired sample T-test with a 95% confidence interval. It shows that rotating leadership scores significantly higher than directive leadership on both process and product quality. Servant leadership scores significantly higher than directive leadership on product quality. There is no significant difference between rotating and servant leadership. As such, our hypotheses about the relationship between leadership style and the quality of the improvisation have been confirmed.

¹ The results of session 6b cannot be used because the performer partially followed the original instructions and partially followed the additional instructions for a negative feedback.

Measure	Relation	Mean difference	Significant?
Process	Directive leadership - Servant leadership	-0,5	No (p = 0,214)
	Servant leadership - Rotating leadership	-0,54	No (p = 0,169)
	Rotating leadership - Directive leadership	+1,04	Yes (p = 0,032)
Product	Directive leadership - Servant leadership	-1	Yes (p = 0,050)
	Servant leadership - Rotating leadership	-0,04	No (p = 0,912)
	Rotating leadership - Directive leadership	+1,04	Yes (p = 0,041)

Table 4: Comparison between leadership styles (paired sample T-test, significant at $p \leq 0.05$)

In the analysis of the transcripts, it becomes clear how the different leadership styles influence the improvisation process. Servant leadership stimulates team work by listening, combining ideas from different team members, and encouraging their interaction. The servant leader stayed calm and constructive, thereby avoiding possible conflicts with and within the team. With his questions, the servant leader encouraged instantaneous reflection, and managed to keep the team focused on the intended result. This control was clearly visible in the transcripts, although both the leader and the team members reported afterwards that they did not perceive it as constraining. The servant leader was thus, successful in creating invisible controls, which steered the team in the right direction, while giving it freedom to act. A good example of this is presented in the following quote:

[Session 2a. Assignment: Make a throne that emphasizes the empress' power while allowing a connection with the commoners. Leader: W].

W: I think we're almost ready. Are you ready? M: Yes, we'll keep that stool like this. W: Is it as you wanted it to be? J: I'm happy. Originally I thought we should create more distance, but I think this fits better with the empress' wishes [...] M: I think the distance is becoming very small [...] W: Why do you think the distance is small? M: Because of the materials. The top is so nice, but the bottom has become rickety.

MT: I think it's perfect, 2 by 2,5 feet. M: I'm sure he'll fit in the room. MT: It's nice and big at the top and stable too, it won't fail. W: To summarize, J and MT think it's good and M, you're not completely satisfied. Isn't there something small you can adjust so you support the decision as well?

J: If we make the seat out better quality material, paneling made of lacquered wood? M: That might do it. J: That way it's more fancy. M: Or maybe we should do it in purple? W: Okay..but...what did the empress say about purple? M: She didn't like it W: Would you do it in purple then? J: I would do the lacquered wood in its natural color. M: Then it's still brown, but less lowering. W: Then I propose to make the seat [...] MT: I've got one here.

The analysis of the rotating leadership sessions shows a big difference between sessions. The first session went very well, with all team members working together perfectly. Everybody had their say and could influence the final product. Team members were not afraid to speak their mind and build on ideas by others. As the simulation progressed, there was a feeling of a job well done from the team members, who all reported this was the best session they had played. In the following quote we see how the team members build upon ideas and also worked toward a good final product.

[Session 3b. Assignment: Make an armor that is both protective, light and becoming. Scene: The actors are making the chest pad for the armor]

[...] MT: Those golden points are interesting too. J: With the points in the front. MT: I'm going to get some gold that we can melt. J: Why don't we use a funnel as a mold? B: A large funnel then. J: I've got two identical funnels here, so we can make them at the same time. Let me just close them up.

B: Shall we make them a bit rounder? It looks kind of funny and I only meant it as a joke. MT: Then we'll just round them off. B: A bit more round. M: Can't we make a them in a flower shape? B: I like that. Shall we make a flower shape gentlemen? M: Like a carnation or a daffodil. MT: Isn't that too womanly? J: A bit too girly, I think. MT: It should still be an armor. M: Let's make sunflowers then! J: Then it becomes a hippy armor. B: Upside down tulips? You still have a cuplike calyx shape. MT: I can live with that. M: Okay! MT: I'll file them in the right shape.

The second rotating leadership session (session 4) showed entirely different results. The team members were very irritated with each other and were not prepared to cooperate. Instead, they all retreated to their own work, as we can see in the quote underneath. Apparently, rotating leadership can lead to a situation where there is no improvisation at all, because the required antecedents for organizational improvisation falter. When this happens, there is no leadership to reinstall them.

[Session 4a. Assignment: Make an armor that is both protective, light and becoming].

JD: Sorry, I made a very nice cap. It was here a minute ago. Did anyone happen to use it, as a dishcloth maybe? A: You lost the cap? JS: Do you mean the leather cap? JD: Yes. JS: Oh, that leather cap. JD: Yes.

JS: Well, I needed something to light the fire to melt the titanium and eeuhm... JD: let me guess, it burned. [...] JS: Well, I might have accidentally burned it. JD: That's very annoying, how can we...

JS: I can make a helmet. A: Yes a helmet, made of titanium. JS: I'm not going to use titanium again! A: I don't care, you caused the problem, you solve it. AL: You'll have to explain it [to the empress]. A: This isn't my problem.

Directive leadership had a negative influence on improvisation. Leaders divided the work among team members, and direct communication within the team was sparse. When team members did work together, they would frequently turn to the directive leader, instead of following their own ideas. If something went wrong, team members would literally freeze and hide a problem rather than solving it, as made clear by the following quote.

[Session 5a. Assignment: Make a toy that is both warlike and peaceful. Leader: MT; M is just done making a puppet representing a princess and is instructed to put it away somewhere safe.]

[M puts the princess in a box that is too small and the head breaks off. M freezes and looks over his shoulder to MT, the leader.] M: Hehe, everything is just fine here, all is well. I'll just put the puppet in this box.

3.1. The role of feedback

As explained above, we altered the nature of the feedback in the directive and servant leadership sessions. Table 5 compares the process and product quality of the sessions with extra instructions about the feedback with the session with the original instructions.

	Feedback	Directive	Servant
Process	Positive	3,5	3
	Negative	2,33	2,5
Product	Positive	4,5	3,75
	Negative	2,83	4,5

Table 5: effects of feedback

For the servant leadership style, the effect is mixed. An instructed focus on negative feedback deteriorated the quality of the improvisation process, which could be expected, but it was remarkable that it had a positive effect on the quality of the output. Apparently, the critical feedback stimulated a focus on meeting the requirements set for the outcome. With regards to the directive leadership style, a huge impact can be discerned. The results measure up with the results of the rotating leadership style. Team members also reported more teamwork and a higher quality process. The leader noted he listened better to team members when he gave feedback, which was corroborated by the team members. One of them remarked: “If you have an ally who is part of the team and who gives positive feedback, this helps you to be creative.” Another comment was: “The mood improved because somebody made sure that you kept on thinking. It also helped in making the product.” Although this positive instantiation of the directive leadership style was only employed in one session, we can tentatively state that with a focus on positive feedback, a directive leadership style can also have a positive influence on improvisation. It can create a culture of trust and experimentation, which is an important antecedent of improvisation. While in a rotating leadership, team members inspire and build on each other, it is in this case the leader who continuously has to bring the spark that ignites improvisation.

4. Discussion & conclusion

The purpose of this paper was to test the assumptions from literature about the relationship between leadership style and organizational improvisation and to investigate more closely how this influence of leadership on the improvisation process works. We hypothesized that servant and rotating leadership styles would have a positive effect on the quality of the process and outcome of the improvisation, where directive leadership was assumed to have detrimental effect.

In general, the experiments confirmed our hypotheses. Directive leadership has a negative influence on the quality of the improvisation process and its outcomes, while servant leadership and particularly rotating leadership have a positive influence. Directive leadership has a control focus, which helps to steer the process towards certain results, but which fails to mobilize the creativity of the team members and to produce good improvisation. Servant leadership, on the other hand, relied on subtle control to steer the improvisation, asking questions and encouraging team work. The combination of relative freedom, inspiring questions, and much direct interactions among team members produced better quality of improvisation. Rotating leadership gave the best results. Team members could step into the leadership role whenever they thought they had the most to offer to the process. The combination of individual freedom, collective goal orientation, and frequent interaction lead to a high quality of improvisation. As such, our experiments corroborate earlier assumptions

about the relationship between leadership and improvisation (Pina e Cunha, Vieira da Cunha et al. 1999; Cunha and Da Cunha 2003; Vera and Rodriguez-Lopez 2007) with empirical data.

However, our study has also revealed additional insights. First, it has shown that rotating leadership is not without risk. It can go terribly wrong, even with experienced improvisers. If the interaction deteriorates, mutual trust collapses, and nobody takes the leadership role, improvisation disappears and no mechanism is present to reinstall it. Second, directive leadership does not necessarily lead to poor improvisation. It seems that when this style incorporates positive feedback to the team members – rather than controlling by giving negative feedback on undesired outcomes – good quality of both the improvisation process and outcomes are possible. This finding runs counter to earlier conclusions in the organizational improvisation literature (Cunha and Da Cunha 2003; Vera and Rodriguez-Lopez 2007).

Our study has important implication for the management of new product development teams. First of all, it has been shown that to enable improvisation to occur, several organizational, team-level, and individual antecedents have to be fulfilled, such as, an experimental culture, minimal structures, and good team work. Leadership is an important element in this, to create and maintain the right antecedents, and deal with the paradox of freedom and control, which is central for improvisation. Secondly, it has been shown that different leadership styles can foster improvisation, but under certain conditions. Rotating leadership seems most appropriate, but as this is quite hard to implement and has a risk to collapse, it might be wiser to choose a different leadership style initially. A servant leadership style is easier to implement and can serve as a good style to start with. By gradually coaching team members on taking initiative and a collective goal orientation, a servant leader can prepare his team for rotating leadership. A directive leadership style, with an inspiring leader giving positive feedback, can also work well. However, a transformation to a rotating leadership is difficult in this case, as team members become dependent on the leader for their improvisation.

There are limitations to this research. The experiments were carried out in hyper reality, under perfect circumstances and with experienced improvisation actors. To enhance the external validity of our finding, further empirical research is required. This could be done with ‘real’ new product development teams in experimental settings, and later also in real organizational setting, for instance by using action research. In these settings, a more fine-grained understanding can be reached about the relationship between the antecedents of improvisation, leadership, and improvisation quality. It could also shed more light on our tentative findings about the possible risks of rotating leadership and the positive impact of directive leadership.

A second line for further research is to use theatrical simulation for different research questions. It could be used to study the individual effects of the other antecedents of improvisation, or to study the workings of conceptually related processes such as bricolage and reflection-in-action. Other applications of this method in the study of organizations, of issues not directly related to improvisation, such as organizational structures, reward systems, or information processing procedures, are also imaginable. We think it is a promising new method in the repertoire of the organizational researcher.

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