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The impact of leadership styles on innovation management - a review and a synthesis

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Abstract. This paper reviews the insights that research offers on the impact of different leadership styles on innovation management. To do so, we develop a framework structuring existing insights into four generic dimensions: people, means, effects, and goals. Based on this framework, we review studies on: directive and participative leadership, interactive leadership, charismatic leadership, transformational leadership, transactional & instrumental leadership, strategic & CEO leadership, and shared & distributed leadership. We find strong indications that different innovation stages and types raise different demands on leadership. Against this background, transformational leadership is not the only style to lead innovations, but different leadership styles fit differently well with different innovation types and stages. However, the specification of this fit is still very incomplete and the answer to the question of how to lead innovations remains sketchy. Before closing, future research needs as well as practical implications are addressed.

Keywords: Leadership styles, Innovation, Leadership, Transformational Leadership

1 Introduction

There are strong indications that leadership is important for innovation management (Nadler and Tushman, 1990; Denti and Hemlin, 2012). Leadership plays a decisive role in enhancing organizational creativity (Mumford et al., 2002; Amabile et al., 2004), launching and driving innovation projects (Stoker et al., 2001; Bossink, 2007), and implementing innovation projects and overcoming resistance (Gilley et al., 2008). Somech (2006) concludes that corporate leaders are the key drivers, who either promote or inhibit innovation management in the organization. According to Bel (2010), different leadership styles are likely to have different impacts on employee involvement and commitment, which in turn influence the climate for innovation management. Deschamps (2005) goes even further, saying that the failure of innovation projects is most likely due to ineffective leadership skills (see also Bass 1990b).

Against this background, it is hardly surprising that a large number of publications have

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already addressed various aspects of the relation between leadership and innovation management (Rickards and Moger, 2006). Since sketching the relationship between leadership and innovation in general is too complex a topic for a single paper, the focus of this review is exclusively on leadership styles with regard to innovation management. The main advantage of focusing on leadership styles is that they are representative of different lines of thought and comprehensive at the same time. Of the different leadership styles that have been identified and described over the years, we will only focus on those that have already established significant links to innovation management. Relevant contributions can be both, conceptual or empirical. What counts is that they explicitly and substantially contribute to the knowledge about the links between a certain leadership style and innovation management. In this paper, we will review how these links have been conceptualized and look at available empirical evidence.

We do not believe that a mere survey of peer-reviewed journal articles gives an accurate picture of the relevant research body, therefore scholarly essay collections and monographs are also included. Specifically, an initial search has been grounded on the authors' previous knowledge of the field as well as on a systematic search in the database: "Business Source Complete – EBSCOhost". The terms used for the search did not only include the generic terms "leadership" and "innovation", but also related terms like "manager", "change agents", "champions", "change" and "transformation" (a detailed account of all used keywords and the number of hits can be obtained from the authors). However, to get a more comprehensive picture of the research body we also included publications referenced by reviewed articles. Additionally we followed up the forward citations ("cited by") of some key publications in Google Scholar.

2 Key constructs

2.1 Leadership

According to the definition of Bass (1990a: 19), "leadership consists of influencing the attitudes and behaviors of individuals and the interaction within and between groups for the purpose of achieving goals." Chemers (1997) defines leadership as "a process of social influence in which one person is able to enlist the aid and support of others in the accomplishment of a common task." Because of their general acceptance among scholars, we have taken these definitions as a conceptual foundation for this review. They imply the existence of four generic dimensions in leadership:

People – By its very nature, leadership is a supra-individual concept that requires a logical distinction between leaders and followers. This distinction can be explicit or implicit, temporary or persistent, but without it, leadership is pointless.

Means – The essence of leadership is that leaders lead, i.e. they carry out certain activities in order to direct or influence followers. The review below will show that these means can include very heterogeneous activities like coaching, empowering, or even servicing. But without such activities there is no leadership.

Effects – The effect of leading is to induce a certain reaction in the followers, i.e. to make them follow. The review will show that the effects can include very

heterogeneous reactions, like increased enthusiasm or commitment, implicit convictions, the rational optimization of rewards, etc. But without any effect, leadership efforts go nowhere.

Goals – Leadership is ultimately associated with certain goals. These goals can be broad visions of promising future states, but they can also be very concrete targets. In either case, leadership points towards a direction. In the context of this paper, goals are essential as leadership here is always directed towards the goal of innovation – this is what this review is about.

The four dimensions (people, means, effects and goals) allow for systematizing the review of the specific leadership styles as they organize logical distinct elements in a consistent way. This allows for creating a systematic and stringent overall analytical framework, making it much easier to compare across leadership styles with regard to the 'essence' of leadership (i.e. the four dimensions). To our knowledge, the "people-means-effects-goals framework" has not been used by other researchers so far.

According to House and Aditya (1997: 451), the term of leadership styles refers "to the manner by which leaders express specific behaviors." Leadership styles are important, since they represent different ways of practicing leadership. In relation to this, the traits of leaders reflect the ability of individuals to practice specific leadership styles. Contextual factors shape the conditions for different leadership styles, specifically the effects they have and the goals that they serve. Therefore, contextual factors cannot simply be added as a "fifth dimension" to the framework; instead, the framework is only valid with respect to specific contextual factors. Against this background, the differences in leadership styles can be specified in terms of the four key dimensions of the "people-means-effects-goals framework". That not all key dimensions have been specified with regard to a specific leadership style does not mean that they do not exist, only that the research is incomplete.

Although there are several constructs closely related to leadership, lack of space means that the discussion of this relationship remains very short. While there have been countless discussions about the relation between leadership and management (Yukl, 1989; Kelley and Lee, 2010), the essence of leadership is that it includes both formal and informal authority, and that it has a very strong focus on the (new) goals to be achieved. Management research is included inasmuch as it meets these criteria. The same applies for other related constructs like change agents (Nikolaou et al., 2007), champions (Howell and Higgins, 1990), etc.

2.2 Innovation

There are perhaps at least as many definitions of innovation management as there are of leadership. According to a rather broad definition by Baregheh et al. (2009: 1334), "Innovation is the multi-stage process whereby organizations transform ideas into improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace." Amabile et al. (1996: 1155) understand innovation management as the "successful implementation of creative ideas within an organization." Creativity is therefore a necessary, but not sufficient, condition for innovation (Amabile et al., 2004). However, we know of no conceptualization that does not qualify innovation as a kind of change. Therefore, change is broadly understood as

the genus of innovation, and innovation is broadly understood as a subset of change (there is no innovation without change). Differences in the conceptualization of innovation result from different specifications of change (the differentia) with regard to substance (what is the subject of change) and impact (what types of change count as innovation). Since leadership and innovation are too broad concepts to be addressed in one review paper, we limit our focus on research contributions investigating the effects of different leadership practices (leadership styles) on innovation processes (innovation management).

It is generally assumed (and this is important for this review) that innovations are typically complex procedures, consisting of a variety of different activities. One classical approach to structure this complexity is the distinction between different innovation stages or phases, like the distinction between ideation and implementation (Amabile et al., 1996; Anderson et al. 2004) or the distinction between conceptualization, development, and commercialization (Stemberg, Kaufman and Pretz, 2004). Creativity is typically seen as an element of the ideation or conceptualization stage and the impact of different leadership styles on creativity is therefore included in this review, but only inasmuch as it relates to innovation (and limited to insights that research offers on leadership). Another classical distinction is that between different innovation types with regard to substance (for instance: product, process, organizational, and market innovation, Schumpeter 1934) and impact (for instance: radical and incremental innovation, Dosi 1982). Also more specific elements of the innovation process have been distinguished, like R&D, resistance and path dependence, creativity, task completion, and others.

These distinctions are relevant for this review because there are strong indications that different activities make different demands on leadership (Nijstad and de Dreu, 2002; Anderson et al., 2004; Gilley A. et al., 2008, see also the review below). This has an important impact on goal setting. With regard to leadership, it is not sufficient to specify the goal as being merely "innovation" as such, but it is necessary to distinguish between different stages, types and specific elements that are functionally related to innovation. We argue that leadership styles are relative to these more specific innovation aspects. The question is then how different leadership styles contribute to the achievement of these more specific, innovation-related goals.

3 Leadership styles and innovation

This section reviews the insights produced by research into different leadership styles with regard to innovation management. Among the different leadership styles available in the literature, we have selected only those who make substantial contributions, and are thus already related to innovation management. We review each style separately and focus on the insights with regard to the four key dimensions: people, means, effects, and goals. Here, we proceed as follows: People – most of the contributions do not make people an issue and many implicitly assume that there is only one leader. We have only included research that explicitly addresses this issue. Means – we have reviewed insights into how leaders are supposed to act (conceptually) and also how they actually practice leadership (empirically). Effects - we have reviewed empirical insights into the effects of the different leadership styles on followers. Goals – we have reviewed

empirical indications for the support of innovation-related goals by the different leadership styles. For instance, Elenkov et al. (2005) offer empirical indications that strategic/CEO leadership can be supportive to achieve organizational innovations. That strategic/CEO leadership is the only leadership style that has been associated with organizational innovation in this review does *not* mean that no other styles have the potential to do so, but that to date no empirical support has been given for any other leadership style to do so. We conclude each section with a "profile", summarizing the most important findings with regard to the four key dimensions of leadership.

3.1 Directive and participative leadership

According to Lornikova et al. (2013: 573), directive leadership "is associated with a leader's positional power and is characterized by behaviors aimed at actively structuring subordinates' work by providing clear directions and expectations regarding compliance with instructions." In contrast to that, Somech (2006: 135) defines participative leadership as "shared influence in decision making". In both cases, the final decision-making power rests with the leader. The main differences relate to both the extent to which leaders consult with followers and the extent to which followers are allowed to express their opinion in the decision-making process. We discuss both styles jointly in this section to compare insights regarding the impact of different forms of participation on innovation. Basically, directive and participative leadership are to be seen as opposite ends of a continuum. However, we acknowledge a potential confusion in the structure. In consequence, we have separated them as LS1a and LS1b in table 1, 2 and 9.

Research offers a few insights into the means, i.e. how directive and participative leadership are executed in innovation projects. In her case study, Kanter (1982) finds that directive leaders drive innovation processes by controlling, monitoring, instructing, and hierarchical influence. Somech (2006: 140) specifies that directive leaders provide "team members with a framework for decision making and action in alignment with the superior's vision." Burpitt and Bigoness (1997) found that participative leaders succeeded in encouraging team-level innovation by getting involved early, and staying involved throughout the entire project, but giving team members the freedom to develop new solutions at the same time.

Research on innovation provides evidence on the specific benefits of directive and participative leadership with regard to different innovation-related goals. On the one hand, research shows that directive leadership is particularly beneficial for establishing clear rules (Somech, 2006). On the other hand, several studies show that participative leadership stimulates creativity and the development of new ideas (Frischer, 1993; Nijstad et al., 2002). Possibly as a side effect of that, Yan (2011) found in a study of 201 companies that participative leadership generally raises the conflict level during the innovation period. This line of research gives the general impression that participative leadership is beneficial during the early innovation stages, whereas directive leadership may be required more in the later stages. With regard to innovation types, Stoker and colleagues (2001) found that participative leadership is particularly supportive for product innovations and R&D.

Table 1. Profile of existing research on directive leadership (LS1a).

People	Means	Effects	Goals
One leader (direct)	Controlling, monitoring, instructing, hierarchical influence Providing a framework for decision making and action	Establishing clear rules	Implementation

Table 2. Profile of existing research on participative leadership (LS1b).

People	Means	Effects	Goals
One leader (consult)	Freedom to develop solutions Early involvement in projects	Innovative climate Increased conflict level	Ideation Product innovation R&D

2 Interactive leadership

The concept of interactive leadership dates back to a study of female leaders by Rosener (1990). In this study, Rosener singled out four core characteristics of interactive leadership: encouragement for participation, widespread sharing of information and power, efforts to enhance self-worth of employees, and energizing employees for different work tasks. With regard to innovation, Bossink (2004: 216) has specified that the interactive leader "empowers others to innovate, cooperates with them to innovate and shows them how to become innovation leaders in the organization themselves." In this sense, not only individuals, but also teams can be empowered (Burpitt and Bigoness, 1997). However, in contrast to distributed and shared leadership, this empowerment is restricted (typically to a project or functional base) and still carried out under the control of the interactive leader. In this sense, empowered leaders act as delegates of the interactive leader.

Research shows that interactive leadership typically involves some kind of guidance, showing empowered employees how to innovate by coaching and providing them with other relevant support (Bossink, 2007). Markham (1998) found that interactive leaders have also used cooperative tactics to direct the activities of empowered employees. Regarding the effects, research demonstrates that interactive leadership is particularly suited to encourage followers to participate and contribute, and that this has a positive effect on the innovation climate, raising the general level of enthusiasm about innovation (Bossink, 2004). However, some researchers argue that this leadership style may not be sufficient for innovation due to its inherent lack of a specific future vision, and thus recommend carrying it out in combination with other leadership styles (1998; Norrgren et al. 1999).

Regarding the goals, research offers some evidence that interactive leadership does indeed contribute to firm innovativeness. In their investigation of 60 teams in 20 companies, Burpitt et al. (1997) found that teams have been most innovative when

actively engaged and empowered. Bossink's (2004) case study gives some indication that interactional leadership can contribute to the success of innovation projects. There is no further specification of innovation stages or types, however.

Table 3. Profile of existing research on interactive leadership (LS2).

People	Means	Effects	Goals
One leader (delegate)	Temporary empowerment of individuals or teams Coaching, guiding, supporting	Encouraging participation Raising enthusiasm Emphasizing involvement Creating Commitment	Unspecified positive effect on innovativeness and innovation success

3.3 Charismatic leadership

According to Weber, charismatic leadership is "resting on devotion to the exceptional sanctity, heroism or exemplary character of an individual person" (1921/78: 215). In the same vein, Shamir et al. (1993) argue that creating a sense of collective identity is essential to being a charismatic leader.

With regard to the means of leadership, there is some solid empirical indication that charismatic leaders lead innovation projects primarily on the basis of their "behavior, beliefs, and personal example" (House et al., 1991: 336; see also Eisenbach et al., 1999). Personal engagement mediates this effect (Nohe et al., 2013). Several studies have reported that charismatic leaders typically attract followers by visualizing a promising future rather than creating dissatisfaction with the status quo (Nadler and Tushman, 1990; Ford and Ford, 1994; Pawar and Eastman, 1997).

There is ample evidence that charismatic leadership can increase commitment, generate energy, and direct individuals towards new objectives, values or aspirations (Nadler and Tushman, 1990; James and Lahti, 2011). Avolio et al. (1991) have noted that charismatic leaders create admiration, respect, loyalty, and a collective sense of mission. In accordance with that, other studies have established a positive link between charismatic leadership and perceived team innovativeness (Eisenbach et al., 1999; Paulsen et al., 2009).

However, there are strong indications that charisma alone is not sufficient to make innovations a commercial success (Nadler and Tushman, 1990). In a study by Bossink (2004), the failure of an innovation project was found to be related to the inability of a charismatic leader to participate in a knowledge network and collect professional information. Bossink further supports this finding in a follow-up study (2007: 140), finding that a charismatic leader was not able to "absorb useful information and knowledge during the project." These results support the conviction of many researchers that, although charismatic leadership supports the creation of an innovative mindset, it has to be complemented by other leadership qualities in order to ensure organizational transformation successfully (Bass, 1985; Nadler and Tushman, 1990).

Table 4. Profile of existing research on charismatic leadership (LS3).

People	Means	Effects	Goals
One leader (direct)	Personal example Visualizing a promising future Leader engagement	Creating commitment, loyalty and a sense of collective mission Generating energy Directing individuals towards new objectives Low absorption of information	Ideation Execution deficits

3.4 Transformational leadership

Transformational leadership was originally introduced by Burns (1979) and further developed by Bass (1985). It has generally been understood as a further development of charismatic leadership (Smith, et al., 2004); some studies even use the two concepts almost interchangeably (Paulsen et al., 2009). Yukl (1989) sees the main motivation of transformational leadership research in the conceptualization of an appropriate style to transform organizations. Against this background, transformational leadership is also the most actively researched leadership style with regard to innovations and change.

Much research has been concerned with the question of what leaders have to do, in addition to charismatic leadership, to master the innovation process successfully. Here, particularly Avolio et al. (1991: 22) have singled out that, besides "idealized [charismatic] influence", "inspirational motivation", "intellectual stimulation", and "individualized consideration" are the most important elements of transactional leadership. Bass (1990b) emphasizes the necessity to work on goals jointly and to keep followers continuously updated. With specific regard to innovations, Howell and Higgins (1990) establish a link between transformational leaders and "champions" that envision and motivate others, have extraordinary personalities, know exactly what to do, and are able to take risks.

Research also offers various insights into the effects of transformational leadership on followers in an innovation context. They are very similar to insights into charismatic leadership since transformational leadership also increases self-efficacy, raises intrinsic motivation, and contributes to employees' psychological empowerment (Gumusluoğlu and Ilsev, 2009; Paulsen et al., 2013); influences followers' attitudes optimistically and creates an overall positive culture (McColl-Kennedy and Anderson, 2002); and raises followers' performance expectations, transforms their personal values and self-concepts, and moves them to a higher level of needs and aspirations (Jung et al., 2003; Kahai et al., 2003). In addition, some authors have found that transformational leadership could increase the level of trust (Dirks and Ferrin 2002; Jung, et al. 2003).

Ultimately, however, there is no agreement about whether transformational leadership can fulfil its aspirations and overcome the shortcomings of charismatic leadership. Gumusluoğlu and Ilsev (2009) are rather positive, and argue that, in contrast to charismatic leaders, transformational leaders not only promote innovative activities within the organization, but also ensure their market success. However, Jamaludin and Rahman (2011) are much more skeptical. In a recent study, they conclude that transformational leadership seems to be more appropriate for stimulating creativity and

generating ideas than for implementing innovations. Similarly, Nadler and Tushman (1990) suggest a combination of charismatic and instrumental leadership for organizational transformation, and Bass and Avolio (1994) a combination of transformational and transactional leadership. All in all, the strong link between transformational and charismatic leadership seems to reveal a basic common sense among many researchers, namely that innovations require strong, "charismatic" leaders which is in line with early concepts of entrepreneurship, e.g. Schumpeter (1934).

Table 5. Profile of existing research on transformational leadership (LS4).

People	Means	Effects	Goals
One leader (consult or delegate)	Personal example Visualizing a promising future Inspiring motivation Intellectual stimulation Individualized consideration Updating followers continuously	Increasing self-efficacy Raising intrinsic motivation Psychological empowerment Creating a positive culture and trust Raising performance expectations Creating needs and aspirations	Ideation Implementa-tion (?) Radical innovations (?)

3.5 Transactional/instrumental leadership

The key principles of transactional leadership date back several decades, however, the concept has been shaped together with transformational leadership by Burns (1979). While there have been intense discussions about the relationship between the two leadership styles (Bass, 1990b; Bass and Avolio, 1994; Jamaludin and Rahman, 2011), researchers agree that, unlike transformational leadership, transactional leadership is not focused on change. Its basic approach is to lead by clear definition and communication of work tasks (Avolio et al. 1991) and rewards and punishments, (Bass, 1990a; Eisenbach et al., 1999) focusing on the basic needs of the followers (Daft 2001). The concept of instrumental leadership is less widespread in research. Like transactional leaders, instrumental leaders also employ rewards and punishments, but focus more on goal-setting and control (Nadler and Tushman, 1990).

Research offers various insights into how transactional/instrumental leadership has been specifically applied to innovation projects. Daft (2001), for instance, found that leaders identify their followers' needs and design exchange processes based on these needs. Bass (1990b) proposes basing incentives on 'contingent rewards' (rewarding good performance and recognizing accomplishments) and 'management by exception' (active and passive search for deviations from existing rules and standards). Sillince (1994) suggests setting up clear goals, defining tasks and responsibilities, establishing standards, and also drafting action plans. In her case study, Bossink (2007) found that leaders hired external professionals to keep projects on track. Regarding the effects of transactional/instrumental leadership, studies show that followers indeed develop expectations about rewards that they receive in exchange for meeting a transactional/instrumental leader's expectations (Tracey and Hinkin, 1998), and that they act rather rationally in accordance with this (Deluga, 1990).

In general, transactional leadership is mostly seen as a means to keep things on track during the implementation phase (Howell and Avolio, 1993), and less suitable for the stimulation of new ideas (Pieterse et al., 2010). Thus, Keller (1992) stated that incremental innovations might be better led by transactional leaders, while radical innovations might be better led by transformational leaders. Sillince (1994) suggests that transactional leadership might be particularly suited to product innovations and R&D teams, since it helps achieve straightforward goals. However, Bossink (2004) presents a case where transactional leadership has worked during all the stages.

Table 6. Profile of existing research on transactional/instrumental leadership (LS5).

People	Means	Effects	Goals
One leader (direct)	Clear definition and communication of work tasks Contingent rewards Management by exception Detection of needs: reward and punishment	Forming clear expectations Rational optimizing of rewards	Implementation, task completion Incremental innovations (?) Product innovations (?) Ideation (?)

3.6 Strategic and CEO leadership

"The study of strategic leadership focuses on executives who have overall responsibility for an organization" (Finkelstein and Hambrick, 1996: 2). Several researchers have pointed to the particular importance of strategic decision-makers (and their hierarchical power) in advancing organizational innovation (Bossink, 2004; Michaelis et al., 2009; Makri and Scandura, 2010). The basic idea here is that CEOs and other upper-echelon decision-makers can use their institutional power "to initiate changes that will create a viable future for the organization" (Ireland and Hitt, 2005: 45).

With regard to the means of CEO/strategic leadership, findings point in two directions in particular: On the one hand, strategic leaders shape the organizational environment by creating organizational structures, processes, and a culture that support innovation (Michaelis, et al., 2009; Sternberg et al., 2004). On the other hand, strategic leaders serve important innovation roles in that they advance new ideas from the conceptualization phase to the development and commercialization phase (Sternberg et al., 2004; Wong, 2013), and devote substantial time to discussing technical matters and detailed designs (Nam and Tatum, 1989). Research has also shed light on the importance of personal traits that strategic decision-makers need to become successful strategic/CEO leaders. Elenkov et al. (2005) point to a person's ability to anticipate, envision, maintain flexibility, think strategically, and work with others, and Harmsen et al. (2000) to commitment and the ability to take risks. None of these authors mention charisma, which again underlines the difference between strategic/CEO and charismatic/transformational leaders. As regards the effects, Norrgreen et al. (1999) found that strategic/CEO leadership generally facilitates employees' innovative capabilities. Concerning the goals, Elenkov et al. (2005) provide some indications that strategic/CEO leadership is suited to supporting both product and organizational

innovations.

Table 7. Profile of existing research on strategic/CEO leadership (LS6).

People	Means	Effects	Goals
One leader (direct or delegate)	Shaping organizational environment Advancing ideas	Enhance followers' competences and innovative capabilities	Implementation Product innovation Organizational innovation

3.7 Shared and distributed leadership

Both shared and distributed leadership challenge the (often implicit) assumption of previous leadership styles, that there is only "one person in charge and the others follow" (Pearce et al., 2009: 234). According to Pearce et al. (ibid.), "Shared leadership can be understood as a dynamic, unfolding, interactive influence process among individuals, where the objective is to lead one another toward the achievement of collective goals." In contrast, in the case of distributed leadership, there are multiple leaders within a group (Mehra et al., 2006). According to Harris (2007), the main difference between the two styles is that distributed leadership focuses on the allocation of power and management skills, while shared leadership focuses on the mutual influences among team members or team leaders.

In the case of innovation, research particularly emphasizes the importance of coaching and guidance in making sure that teams are on the right track (Muethel and Hoegl, 2010). Additionally, Friedrich et al. (2010) point to the importance of rewards in motivating distributed leaders, thereby establishing a link between distributed and transactional/instrumental leadership. Barry (1991) points to the importance of trust for distributed leadership. This trust relates to people, and not (as with transformational leadership) to a future vision. Hackman (1990) found that commitment is important for distributed leaders, but also that leaders have a dynamic and open attitude, expertise in managing autonomous teams, and strong communication skills. However, according to Barry (1991), the flip side of the coin is that distributed leadership is time-consuming and difficult.

To date, there are only few empirical insights into the impact of distributed leadership on innovations. Pearce and Manz (2005) argue that shared leadership appears to be especially important for continuous innovation; but there is no further specification of innovation stages or types.

Table 8. Profile of existing research on existing research on shared/distributed leadership (LS7).

People	Means	Effects	Goals
Multiple leaders (shared or distributed)	Coaching and guiding Rewards Commitment	Trust in people Negative: High effort	Continuous innovation

4 Discussion and conclusion

Table 9 lists the key findings of the previous sections regarding the four key dimensions: people, means, effects, and goals.

Table 9. Structured integration of insights into the different leadership styles in relation to innovation.

People		
One leader Direct (LS1a, LS3, LS5, LS6) Consult (LS1b, LS4) Delegate (LS2, LS4, LS6)	**Multiple leaders** Shared (LS7) Distributed (LS7)	
Means		
Inspiration Personal example (LS3, LS4) Visualizing future (LS3, LS4)	**Shaping the micro climate** Creating structure and Processes (LS5, LS6) Shaping the culture (LS6)	**Supporting people and projects** Coaching, guiding (LS2, LS4, LS7) Detection of needs, serving (LS4) Acquiring external expertise (LS5)
Involvement Leader involvement in projects (LS1b, LS3, LS4, LS5, LS7) Followers' involvement (LS1b, LS4, LS7) Empowering and autonomy (LS1b, LS2, LS4, LS7)	**Creation of innovative structures** Goal setting, tasks and responsibilities (LS1a, LS5) Directing (1a, 5); Controlling, monitoring (LS1a, LS5) Reward and punishment (5)	
Effects		
Attitudes Energizing, enthusiasm (LS2, LS3, LS4) Loyalty (LS3, LS4, LS7) Commitment (LS2, LS3, LS4)	**Mindset** Directing towards new objectives (LS3, LS4) Innovative climate (LS1b, LS3, LS4, LS7)	**Trust** In people (LS4) In structure (LS5, LS7) In visions (LS3, LS4)
Behavior Specific activities (LS1a, LS5) Involvement (LS2, LS3, LS4, LS7) Rational optimization (LS5)	**Negative effects** High effort (LS7) Increased conflict level (LS1b)	**Others** Enhancing of followers' competences and capabilities (LS6) Directing individuals towards new objectives (LS3)
Goals		
Ideation (LS1b, LS3, LS4) Implementation (LS1a, LS5, LS6)	Incremental innovation (LS5) Radical innovation (LS4)	Product innovation (LS1b, LS5, LS6) Process innovation (LS1a, LS6) Administrative innovation (LS6) Resistance, task completion (LS1a, LS5)
LS1a – directive leadership LS1b – participative leadership LS2 – interactive leadership LS3 – charismatic leadership	LS4 – transformational leadership LS5 – transactional/ instrumental leadership LS6 – strategic/CEO leadership LS7 – shared and distributed leadership	

The numbers relate the different entries in the matrix to the different leadership styles. For instance the numbers (LS2, LS4, LS6) after "delegate" indicate that this entry can be related to interactive leadership, but also to transformational, and strategic/CEO leadership. Thus, the entries for the different numbers correspond to those in the seven

previous tables (they are not identical though, as they have been partly integrated in more general categories). Again, this table does not show potential or theoretical links, but only links that have already been established by actual research. In other words: That, for instance, incremental innovation does not show an entry for LS4 – transformational leadership – *only* means that research has not yet offered empirical support for this link and *not* that this link cannot be established.

Clearly, the different entries in the table are not independent of each other, so they cannot be seen as a toolbox to pick from at discretion. First of all, some of the entries logically exclude each other (like directing and consulting). Other entries do not logically exclude each other, but they are generally regarded as being inconsistent and have never been combined (like rewards and punishment and specific forms of intrinsic inspiration). Basically, there is a "downstream" dependency in that the means depend on the people, the effects depend on the people and means, and the goals depend on all other elements. In table 9, the different leadership styles appear as combinations of different entries ("patterns" of entries) that have been regarded as being consistent.

As a result, table 9 gives a structured overview of all options for people, means, effects, and goals that have been specifically investigated with regard to innovation management so far. Table 9 thus integrates the key findings from each partial review on specific leader styles' effect on innovation management. This overview first of all shows that many of the known leadership styles have already been explicitly linked to innovation. In this sense, research is already quite comprehensive. Yet, there are two more specific insights that can be drawn from the overview in table 9: First, transformational leadership is not dominating or even all-embracing with regard to innovation. There are several other, structurally distinct, leadership styles that have been positively related to innovations. In this sense, the findings of this review clearly reject the idea that there is only one specific leadership style for innovations. Second and closely related to that, there are strong indications that different innovation stages and types raise different demands on leadership and that the effectiveness of different leadership styles is relative to innovation stages, types and specific elements (like R&D or resistance). However, table 9 shows that this fit between leadership styles and innovation stages, types and specific elements has been specified very incompletely and there are many "blank spots". For example, none of the leadership styles have ever been explicitly related to market innovations; transformational leadership has been related to innovation stages (and here even with contradicting findings), but only very incompletely to innovation types, etc. In this regard, research is quite inconclusive. This first of all has important practical implications.

4.1 Practical implications

If the choice of leadership styles is relative to specific innovation stages and types and if this relation is poorly specified, then research fails to give a clear answer to the question of how to lead innovations. To date, research is scattered and only offers some indications that certain leadership styles (particularly charismatic and transformational leadership) seem better suited to inspire and motivate followers and that this has a positive impact on the ideation stage and also seems to spur radical innovations. Other leadership styles (directive and transformational leadership, possibly also CEO/strategic leadership) seem better suited to structure organizational activity and to

overcome resistance, and therefore have a positive impact on implementation and possibly also on incremental innovations. But what is with the ideation stage of an incremental process innovation? Here, existing findings do not form a coherent picture: There are no findings for this specific case and the related, more general findings contradict each other ("ideation" speaks for charismatic and transformational leadership while "incremental process innovation" for directive and transformational leadership). This is problematic since the effects of leadership styles are substantially different and often even opposite. The managerial implication is that there is no one-size-fits -all solution, but the choice of the most appropriate leadership style is relative to the specific innovation goals to achieve.

However, research on leadership styles offers instructive insights regarding the specific effects of various means that are relevant for innovations. There are relevant insights on how to produce specific effects regarding attitudes, mindset, trust, behavior, competence creation, etc. For example, there is comprehensive research on how to energize followers with regard to innovation; and a clear link could be established with interactive, charismatic and transformational leadership. It has been investigated how this effect can be produced and what it means for innovations. There are also valuable insights about counterproductive effects, particularly with regard to high conflict potentials, effort, and absorption of information. Table 9 relates these insights to different research streams and can therefore be read like a 'practical' manual, helping managers to realize dimensions of the relationship between different leadership styles and innovation management.

In this regard, research fails to offer the big picture of how to lead innovations, specifying the fit between leadership styles and different innovation types and stages; at the same time, existing research is quite instructive regarding various effects of leadership and how these can be brought about.

4.2 Future research avenues

There is certainly an obvious need for much more research on the link between different leadership styles and different innovation stages, types, and elements. This is mostly an empirical question as it aims at establishing factual relationships. It still requires some explorative research to further detect existing links and mechanisms, but most of all quantitative empirical research to investigate the validity of causal structures. These research needs can be derived directly from the findings in table 9. They include, but are not restricted to, a comprehensive investigation of the fit between charismatic and transformational leadership and different innovation types (product, process, market, organizational innovation); a closer specification of the effects of interactive leadership with regard to innovation stages and types; an investigation and comparison of the effectiveness of different leadership types for market innovations. Also more empirical research is needed to substantiate existing findings on the fit between different leadership styles and the ideation and implementation stage of innovation.

There have already been some valuable contributions on this (like in Nadler and Tushman, 1990, and Bass and Avolio, 1994), but more research is still needed to specify the link between different leadership styles and possible interactions in innovation projects. This is first of all a theoretical question as it addresses the logical structure of the different styles. To specify the link between different leadership styles

requires decomposing them into different elements. At this point the proposed "people-means-effects-goals framework" might be of particular use as it helps to distinguish different dimensions according to a coherent logical structure. Empirical research is needed to specify the effects of different combinations of leadership styles in specific innovation settings, for instance the effects of changes in the power structure in the course of an innovation project.

With the "people-means-effects-goals framework", this paper offers a structural foundation for future research as it structures the different elements of leadership and indicates relationships. In this sense, this paper offers a master plan – future research "just" has to fill-in the different fields. An important limitation of this review, however, is that contingency factors could not have been included. The reason for this is that the complexity would then increase to an extent that is impossible to handle in one paper. Seen from a systematic point of view, contingency factors enter the picture as they moderate the relation between the different elements of the table. Technically, this requires adapting the entries and relations (numbers) of table 9 to different contexts. There is quite some research investigating the role of contingency factors for leadership with regard to innovations (for a review of this research see Denti and Hemlin 2012). However, this research is too complex to be integrated in this review.

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