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**The Emergence of Executive Champions
and their Impact on Innovation Performance**

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ABSTRACT

Highly recognized case studies and the intuitive notion that a heroic champion is required to help innovations overcome the indifference or even resistance that they face in many organizations explain that there has been a positive bias among academics and managers toward the role of champions in innovation processes. A look into the previous empirical literature on champions reveals, however, that a rigorous empirical investigation into organizational factors causing the emergence of executive champions and their impact on innovation performance is lacking. In addition, previous empirical research on champions is plagued with methodological problems such as measurement issues and single informant bias. This study uses multiple informant data from 258 respondents from 43 firms to examine various hypotheses. The findings reveal that executive champions are likely to emerge in organizational cultures that are conducive to innovation and they are less likely to emerge in organizational cultures that are unfavorable for innovation. We further find a non-linear, inverted u-shaped relationship between the level of executive championing activity and innovation performance. We find, in contrast with the commonly held belief, that executive champions have a strong negative impact on innovation performance particularly in cultures that make it difficult to innovate. Among the tested moderators, only the implementation of incentives for executive champions based on innovation performance offsets the negative impact of these champions on innovation performance. The findings lead us to substantially rethink the commonly believed role champions play in innovation processes.

INTRODUCTION

Continuous innovation is an increasingly important determinant of company performance in many industries (Debruyne et al., 2002; Han, Kim and Srivastava, 1998). Consequently, much research effort has been undertaken to identify critical variables that impact the success or failure of innovations (Ernst, 2002; Gerwin and Barrowman, 2002; Henard and Szymanski, 2001).

The contribution of champions has been frequently linked to the success of innovations (Day, 1994; Howell and Higgins, 1990; Schon, 1963). A champion “is an individual who informally emerges in an organization and makes a decisive contribution to the innovation by actively and enthusiastically promoting its progress through the critical organizational stages” (Howell and Higgins, 1990: 317). The fundamental reasoning for the importance of champions for the success of innovations was initially put forward by Schon (1963). He argued, based on the examination of various case studies of radical innovations in the military services, that champions are essentially required to overcome resistance to change in an organization to successfully develop and implement innovations. Schon (1963: 84) concluded: “Given the underground resistance to change described earlier, the new idea either finds a champion or dies.”

Various, often prominent and highly visible case studies of successful championing seem to support Schon’s (1963) early contention (Chakrabarti, 1974; Day, 1994; Fischer et al., 1986; Frey, 1991; Markham and Griffin, 1998). The few existing and more rigorous empirical studies, however, show conflicting results. Markham and Griffin (1998) find a weak but positive impact of champions on innovation performance, whereas Markham (1998 and 2000) observes no relationship between the presence of champions and innovation performance. It appears that the intuitively appealing notion of the heroic champion, who fights for the innovation and takes a high personal risk to overcome the indifference and resistance in the organization (Schon, 1963), has resulted into a biased positive view of championing, which seems to be unjustified in the light of missing broader empirical evidence (Markham, 2000). A further contributing factor to this biased picture of champions is that unsuccessful cases of championing remain mostly invisible. Champions openly identify themselves with successful rather than unsuccessful outcomes and failed champions rarely seek attention and are thus less noticed (Markham and Griffin, 1998). That unsuccessful championing occurs is shown, for example, in the case of Volkswagen’s luxury car Phaeton, which was introduced to compete

with other luxury cars such as the top-of-the-line products of the Mercedes S-Class, the BMW 7-Series and Toyota's Lexus. This radical innovation for Volkswagen was strongly championed at the highest management level. Volkswagen recently reported that the car is not selling well on the market and that an unplanned depreciation of assets of EURO Mio. 500 had to be made (Frankfurter Allgemeine Zeitung, 2003).

Theoretically, the negative impact of champions on innovation performance can result from their inherent characteristics. Schon (1963: 84-85) describes champions as individuals that "identify with the idea as their own, and with its promotion as a cause, to a degree that goes far beyond the requirements of their job. In fact, many display persistence and courage of heroic quality. For a number of them the price of failure is professional suicide, and a few become martyrs to the championed idea." It has been shown that the strong identification of managers with an innovative product leads to an escalation of commitment in new product development (Schmidt and Calantone, 2002). Escalation of commitment is defined as the continuation in a failing course of action (Staw and Ross, 1987). The escalation of commitment causes the continued funding of the innovation project and reduces the likelihood that the project is terminated (Boulding, Morgan and Staelin, 1997; Schmidt and Calantone, 2002). Markham (2000) found that champions succeed to secure sufficient resources for their innovation project and to prevent the project from being terminated. These empirical results lead to the assumption that championing can cause an escalation of commitment and hence reduced innovation performance.

The theoretical basis of the champion concept and the existing empirical findings suggest that we need to re-conceptualize the impact of champions on innovation performance. We argue that the general characteristics of champions can either have a positive or a negative impact on the success of innovations. The central proposition of this paper is, therefore, that we hypothesize a non-linear, inverted u-shaped relationship between the presence of champions and innovation performance. This hypothesis has not been tested empirically yet. Based on this premise, our attention must shift towards the examination of factors, which moderate the impact of champions on innovation performance. Ideally, we should find options for management to maximize the positive impact of champions and to minimize their negative impact on innovation performance. Previous empirical research on champions does not yet offer answers to this question.

Existing empirical research on the emergence of champions has focused on personal characteristics and leadership behavior of champions (Howell and Higgins, 1990) and project characteristics (Day, 1994; Markham, 2000). Markham and Griffin (1998) find weak evidence that organizational-level factors such as a firm's strategy and the implementation of a new product process facilitate the emergence of champions. Previous research on champions, however, has not addressed the organizational-level factor yet, in which the theory about champions for innovation is fundamentally grounded. The basic notion is that champions emerge and have a strong impact on innovation success in environments, which are unsupportive for innovation (Schon, 1963). Other authors, by contrast, argue that champions should emerge in organizations, which are conducive to innovation (Markham and Griffin, 1998). A satisfying answer to this core question of championing based on empirical data is missing.

A further shortcoming of previous research on champions arises from a methodological perspective. Previous research on champions does not always use well-developed measures to capture the presence and impact of champions (Markham and Griffin, 1998). Furthermore, the existing studies on champions are based on surveying single informants. It has been shown that empirical innovation research based on single informants often lacks construct validity because of a strong informant bias (Ernst, 2003). Construct validity is the fundamental requirement in empirical research, because hypotheses should be tested only after construct validity has been achieved for all measures required for testing the hypotheses (Bagozzi, Yi and Phillips, 1991). Thus, rigorous empirical innovation research should be based on multiple informant data to establish the construct validity of measures (Ernst, 2003). It could be that the failure to establish a significant relationship between the presence of champions and innovation performance in previous studies was caused by these methodological constraints.

The conceptual and methodological problems of previous research call into question the adequacy of our current knowledge about champions. The present study addresses these problems and makes the following contributions to the existing body of knowledge regarding champions: First, we will answer the fundamental and still unresolved question, if champions have an impact on the performance of innovations. This is the prerequisite to further justify research into the area of champions. The central hypothesis of this paper is that champions have a positive as well as a negative impact on innovation performance. Second, we identify moderating factors, which can either reinforce or weaken the effects of champions on innovation performance. Third, we provide evidence, if champions are more likely to emerge in environ-

ments that are either conducive or unsupportive to innovation. We challenge the old and dominating belief that champions are particularly effective in hostile environments characterized by strong resistance to change and innovation. Fourth, we test our hypotheses based on valid constructs from multiple informant data. This allows us to derive conceptual and managerial conclusions regarding the theory of champions of innovations based on rigorous empirical grounds.

Among the various types of champions identified in the literature (Chakrabarti and Hauschildt, 1989; Howell and Higgins, 1990; Markham, 2000), we focus on the executive champion (Maidique, 1980). According to our definition, the executive champion comes from the highest management level in the organization, i.e. from top management. We chose to focus on the executive champion for mainly two reasons: First, executive champions have the strongest impact on innovation projects because of their strong hierarchical power base (Chakrabarti and Hauschildt, 1989). They can overcome resistance, they can secure the required resources and they can impact termination decisions (Markham, 2000). Second, executive champions associate more often with highly innovative projects (Day, 1994), which can have, either way, a strong positive or negative impact on organizational performance. We therefore believe that studying the emergence and impact of executive champions on innovation performance is most relevant from an academic as well from a managerial perspective.

THEORY AND HYPOTHESES

Organizational Culture and the Emergence of Executive Champions

The theory of champions of innovations has been strongly rooted in the assumption that champions are required to overcome organizational inertia, indifference and resistance to innovation (Chakrabarti, 1974; Day, 1994; Howell and Higgins, 1990; Markham, 2000; Schon, 1963). The higher the resistance, especially to highly innovative ideas, the more important are executive champions due to their capability to overcome strong resistance because of their strong hierarchical power base (Chakrabarti and Hauschildt, 1989; Day, 1994; Markham, 2000). We give an example for illustration: Engineers within Seagate had developed the prototype of a new 3.5-inch hard disk drive technology to replace the existing 5.25-inch technology, which had made Seagate the leading firm in this market segment (Bower and Christensen, 1995). The prototype of the new technology was initially developed as an unofficial project because it did not receive support from senior management. The project was later stopped

because it faced strong resistance within the organization. Major resistance came from Marketing because major customers rejected the new technology; it further arose from the existing 5.25-inch business line, which did not want to shift attention to a new and risky technology and it came from the sales force, which did not see a market potential for the new technology in small emerging markets and was interested to remain focused on the high sales volumes in the mainstream market. Without the support of executive champions, the project was destined to be terminated. When the project was finally stopped due to a lack of executive support, the engineers left Seagate and founded a new firm. Within a short period of time, the new firm drove Seagate out of the market it had formerly dominated (Bower and Christensen, 1995).

Resistance against innovation largely results from the type of culture to be found in organizations (Burns and Stalker, 1961; March and Simon, 1958). We therefore argue that organizational culture has an impact on the emergence of champions. Based on the earlier work by Quinn and Rohrbaugh (1983), Cameron and Freeman (1991) suggest a typology of organizational cultures, which distinguishes types of innovation-friendly and innovation-unfriendly cultures. Cameron and Freeman (1991) identify four types of organizational cultures: hierarchy, clan, adhocracy and market. These types of cultures are further characterized according to four core attributes of organizational culture: dominant values, style of leadership, the bases for bonding and the strategic emphases present in the organization (Cameron and Freeman, 1991). Bonding refers to the set of shared, underlying values and understandings in an organization, which act as the “glue” that holds the individual members of the organization together (Schein, 1985). Strategic emphases describe the organization’s general orientations used to achieve organizational effectiveness (Cameron and Freeman, 1991).

The hierarchy culture, as an innovation unfriendly culture, is characterized by the existence of mechanistic processes (Burns and Stalker, 1961) and a focus on internal maintenance. Dominant values of the hierarchy culture are standardization, formalization and stability. Leaders in a hierarchy culture are viewed as coordinators and administrators. Bonding between individual members of the organization is achieved by means of rules, policies and procedures in hierarchy cultures. The strategic emphases in hierarchy cultures are stability, predictability and the securing of smooth operations (Cameron and Freeman, 1991). Based on the assumption that the emergence of executive champions is caused by the degree of resistance and that resistance is a result of the culture to be found in firms, we postulate the following hypothesis:

Hypothesis 1: The more a company displays the characteristics of an innovation-unfriendly hierarchy culture, the more executive champions emerge to support innovations.

Culture can on the contrary facilitate the emergence and impact of executive champions. These champions are dedicated to their project and their personal involvement is particularly important for the success of highly innovative projects (Day, 1994). These projects often involve a high level of risk and uncertainty. The means by which an organization supports executive champions has a strong effect on the individuals' willingness to fully dedicate themselves to the project. The support of executive champions results from the organization's belief that innovation is important and that effective champions are required for successful innovation. Therefore, a culture, which is supportive to innovation and championing, should have a positive impact on the emergence of executive champions (Markham and Griffin, 1998). In addition, the less resistance the project faces within the organization, the greater is the effectiveness of executive champions. Going back to the above quoted example of Seagate, one could also argue that no executive champion emerged because the firm's culture was not supportive to this new innovation (Bower and Christensen, 1995).

According to the framework suggested by Cameron and Freeman (1991), adhocracy culture creates an innovation-friendly environment in the firm. Adhocracy culture is characterized by the existence of organic processes (Burns and Stalker, 1961) and a focus on external positioning. Dominant values of the adhocracy culture are entrepreneurship, creativity, risk-taking and adaptability. Leaders in adhocracy cultures are viewed as entrepreneurs, innovators and risk-takers. Bonding in adhocracy cultures is based on a shared commitment to entrepreneurship, flexibility and risk. The strategic emphases in adhocracy cultures are innovation, growth and acquiring new resources (Cameron and Freeman, 1991). In contrast to hypothesis H₁, we postulate the following additional hypothesis:

Hypothesis 2: The more a company displays the characteristics of an innovation-friendly adhocracy culture, the more executive champions emerge to support innovations.

Impact of Executive Champions on Innovation Performance

Executive champions mainly support innovations by blocking opposition, by securing the required resources, by enlisting greater organizational support and by preventing the project

from getting terminated (Chakrabarti and Hauschildt, 1989; Maidique, 1980; Markham, 1998 and 2000; Schon, 1963). These activities are assumed to have a positive impact on innovation performance. Anecdotal evidence from various case studies support this assumption (Chakrabarti, 1974; Day, 1994; Fischer et al., 1986; Frey, 1991; Markham and Griffin, 1998; Schon, 1963). Evidence for this assumption based on rigorous empirical analyses, however, is missing. Markham and Griffin (1998) find a weak impact of champions on innovation performance, however, it remains unclear what type of champion the authors looked at and the measure for the level of champion activity is very crude. By contrast, Markham (1998) finds that champions make no positive contribution to project performance. He does not differentiate between multiple types of champions either, which makes it impossible to filter out the impact of executive champions (Markham, 1998). An empirical study, which focuses on champions from top management, reveals that these champions have no impact on project performance either (Markham, 2000). Thus, the core assumption that champions in general and executive champions in particular have a positive on innovation performance is not supported by rigorous empirical evidence yet.

The lack of empirical data showing an impact of champions on innovation performance can be attributed to either methodological and/or conceptual deficiencies of previous research. From a conceptual perspective, the hypothesis that champions must only positively impact innovation performance is not convincing. The strong commitment and identification of champions to their project, which is generally viewed as a strength of championing (Markham, 2000; Schon, 1963), can at the same time turn into a weakness of championing. It has been shown that strong commitment and identification of managers with an innovation can lead to an escalation of commitment, i.e. to a continuation of a failing course of action (Schmidt and Calantone, 2002). The escalation of commitment has been found to be higher in case of more innovative products (Schmidt and Calantone, 2002). The escalation of commitment leads to the prevention of terminating an innovation project despite that fact that it is doomed to become a failure (Boulding, Morgan and Staelin, 1997; Schmidt and Calantone, 2002 and 1998). It was shown that strong executive championing is negatively associated with termination decisions (Markham, 2000). At the same time, executive champions manage to secure sufficient resources for their innovation projects (Markham, 2000). If executive champions keep pouring significant resources into a failing project, the direct impact on innovation performance is negative. The escalation of commitment for one project can further create high opportunity costs, if resources are diverted from other, eventually more promising

projects. Strong executive championing can thus cause negative indirect effects on innovation performance, too. Based on this discussion, we postulate the following core hypothesis regarding the impact of executive champions on innovation performance:

Hypothesis 3: There is an inverted u-shaped relationship between the level of executive champion activity and innovation performance.

The basic assumption articulated in hypothesis three leads us to explore strategies to limit the negative impact of executive champions on innovation performance. This can be achieved by measures designed to reduce the escalation of commitment in innovative projects. One option suggested in the literature to de-escalate commitment are decision aids and procedures. They are designed to enrich the information environment for decision-making during innovation processes (Boulding, Morgan and Staelin, 1997). This approach is based on findings by Simonson and Straw (1992), who showed that asking managers to compare actual results relative to pre-specified levels before allocating resources reduce future investment commitment to a losing course of action. Boulding, Morgan and Staelin (1997) find in experiments with senior managers that pre-committed stopping rules significantly reduce the escalation of commitment for innovations. Based on these conceptual and empirical insights, we postulate the following hypothesis:

Hypothesis 4: The relationship between the level of executive champion activity and innovation performance is positively moderated by the existence of decision aides and procedures designed to monitor and evaluate projects along the innovation processes.

Incentives, which are tied to the achievement of desired outcomes, are a further strategy to reduce the escalation of commitment. Principal agency theory suggests that behavior can be influenced by setting the right incentives. The above described decision aids and procedures are related to the innovation process, whereas incentives are based on the innovation outcome. We argue that one should observe a de-escalation of commitment for a failing course of action, if incentives for executive champions are tied to the achievement of performance objectives for innovations. Therefore, we test the following hypothesis:

Hypothesis 5: The relationship between the level of executive champion activity and innovation performance is positively moderated by the existence of incentives for executive champions that are based on innovation performance.

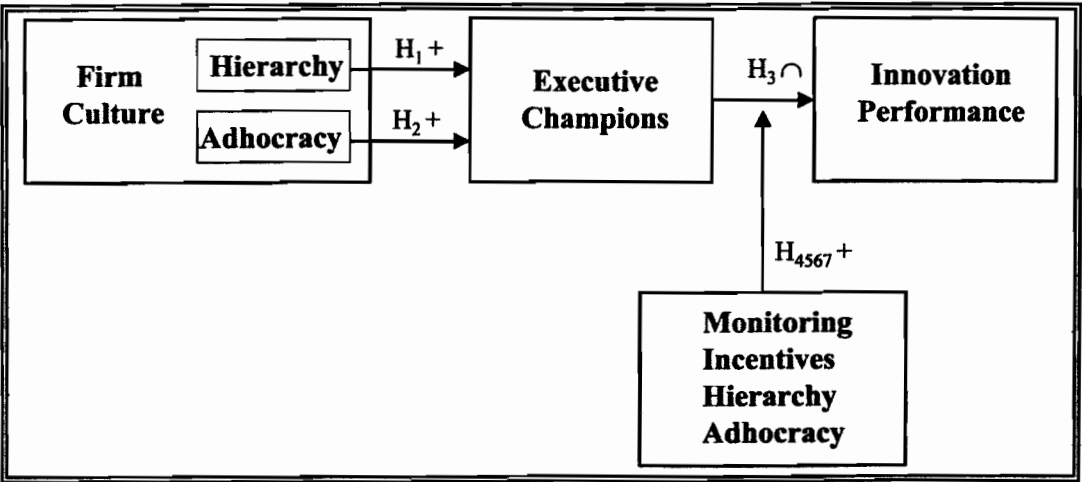
The two types of culture, which are assumed to impact the emergence of executive champions, are further included as moderators in the empirical analyses. Consistent with our previous discussion we postulate that executive champions have a stronger impact on innovation performance either in hierarchy cultures because they have to overcome resistance or in adhocracy cultures, which facilitate the effectiveness of executive champions. Accordingly, we test the following two hypotheses:

Hypothesis 6: The relationship between the level of executive champion activity and innovation performance is positively moderated by the degree of an innovation-unfriendly hierarchy culture in the firm.

Hypothesis 7: The relationship between the level of executive champion activity and innovation performance is positively moderated by the degree of an innovation-friendly adhocracy culture in the firm.

Figure 1 summarizes the conceptual model of this study, which links organizational culture, the presence of executive champions and innovation performance while taking important moderating variables into account. The respective seven hypotheses will be tested in the subsequent empirical analyses.

Figure 1: Conceptual Framework: Emergence and Impact of Executive Champions



METHOD

Sample and Data Collection

Forty-three, well-established companies, primarily from the machinery, chemical and electronics industries, representing the classic structure of the German manufacturing industry, participated in the study. Innovation is of great importance in these industries and this is illustrated by the fact that more than 2/3 of the total patent applications at the German patent office originate from these three industries (GPO, 2002). On average, these firms had sales of EUR 373.40 million (std. dev. = EUR 294.22 million) and spend 4.88 % (std. dev. = 2.95 %) of their total sales on R&D, which is slightly above the average R&D-to-sales ratio for the German manufacturing industry of 4.66 (Legler et al., 2002). Companies were surveyed on various aspects related to the management of innovation. In each company, six knowledgeable respondents from different organizational positions with many years of experience with their company's innovation management were surveyed. In each company there are three respondents from senior management and three respondents from the project level. For each of the two hierarchical levels, respondents are always from R&D, marketing and production. These functional areas are typically most involved in the innovation process and, therefore, are relevant for this investigation (Kahn, 1996). Complete data for 43 firms lead to a total number of 258 observations that are used for the analyses. 129 of the respondents are from each of senior management and the project level and 86 respondents are from each of R&D, marketing and production.

Collecting multiple informant data requires a sophisticated data collection procedure; thus, a traditional questionnaire was not sent to companies. The data collection was embedded within a small project that sought to improve innovation management in each of the participating firms. The questions regarding the constructs in our conceptual model were elements of a longer questionnaire. Each company nominated a liaison manager to supervise the coordination of the survey within the organization. It was carefully explained to the informants that they were being asked to assess culture for the entire company from their own subjective point of view. Critical terms and expressions used in the questionnaire, such as, for example, 'What is considered to be an innovation?' were defined prior to the survey for the specific context of the firm. All respondents also had the opportunity to ask the contact person in the company or to call the researchers directly whenever questions arose while completing the

questionnaire. This procedure ensured that all of the questionnaires were fully understood and answered in their entirety by the respondents.

Preliminary talks with the companies revealed that none of the targeted respondents could provide accurate assessments of innovation performance because they did not know the numbers. Since it was the objective to secure a valid assessment of innovation performance, a separate questionnaire was sent to the firm's financial accounting department via the liaison person. This approach was made possible because it was also in the interest of the firm to gain the most accurate assessment of innovation performance based on objective data. The assessment of innovation performance was made on the provided five-point scale. The assessment of performance was carried out for the entire portfolio of innovations and not only for single projects. The fact that innovation performance was assessed by a source other than the respondents for the independent variables reduces the impact of the common-method bias on the empirical findings. In addition, we collected an objective measure of overall firm performance, i.e. the operative profit margin. This measure indicates the profitability of a firm in its core product areas and can be used to cross-validate the innovation performance measure.

Each company obtained a comprehensive benchmarking analysis identifying strengths and weaknesses of its innovation management and providing recommendations for improving the performance of innovations. The results of the benchmarking analysis were presented and discussed in each of the participating organizations. During the presentation of the benchmarking results, at which members of the board of directors were present, the innovation performance numbers were again discussed and verified. Thus, there is good reason to assume that the construct measuring innovation performance represents the true situation within the firms. Each presentation and discussion ranged from three hours to the entire day. This provided us with the opportunity to gain further insight into the company and to be able to better interpret some of the empirical results. The strong commitment of each participating organization ensured a complete data set with no missing values and a final verification through the benchmarking analysis and presentation. It should be noted that a self-selection bias might be present within the data set.

Measures

We decided to conduct the empirical analyses at the firm level and not for individual projects for the following two reasons: First, championing causes high opportunity costs, for example, resources for a project that is strongly championed are lacking for other projects. The true effect of championing on performance can thus only be inferred from analyzing firm level data. This allows us to making more general conclusions regarding the impact of championing on performance. The failure of previous studies on champions to find a significant impact of champions on performance can be caused by the fact that they were conducted at the project level. Second, the impact of organizational culture on performance can only be examined at the firm level. Consequently, our hypotheses can best be tested at the firm level. The measures for the elements of the conceptual model (figure 1) take this aspect into account:

Executive Champions: This measure should reflect three core characteristics of executive champions: First, executive champions must come from the top management level in the organization. Second, champions contribute to innovation projects by securing the necessary resources (Markham, 2000). Third, champions are firmly committed to the innovation project (Howell and Higgins, 1990). Since this study is conducted at the firm level, one cannot identify an individual executive champion for a specific innovation project. We therefore chose to pose the questions generally independent from a specific individual or innovation project. All executive champions came from the board of directors of the sample firms. The informants rated items developed by the authors on a five-point scale. The reliability coefficient Cronbach's alpha for the construct 'executive champion' based on informants from senior management and used for the testing of our hypotheses is .75 (see appendix).

Culture: This study uses the scale proposed by Cameron and Freeman (1991) for the measurement of the culture types. The informants were asked to assess their organization in the previously described four categories: dominant values, leadership style, bonding and strategic emphases. Within each category, informants distributed a total of 100 points over four qualitative statements reflecting each type of culture. Based on the distribution of points over each statement and category, a total score per type of culture can be computed for each organization. Each organization has attributes from each of the four types of culture where certain of these types are more dominant than others. The reliability coefficient Cronbach's alpha for the

constructs ‘adhocracy culture’ and ‘hierarchy culture’ based on informants from Marketing and used for the testing of our hypotheses is .75 and .85, respectively (see appendix).

Monitoring: This construct captures in general, if well-structured information is provided over the innovation process to better assess the actual performance of the innovation project in comparison to pre-specified targets. Innovation projects should be systematically monitored over the various phases of the innovation process in the firm. Transparent evaluation criteria should exist for the assessment of projects and the evaluation and decision process should be institutionalized within the organization. The informants rated items developed by the authors on a five-point scale. The reliability coefficient Cronbach’s alpha for the construct ‘monitoring’ based on informants from the project level and used for the testing of our hypotheses is .73 (see appendix).

Incentives: This construct measures, if the innovation performance of the entire portfolio of innovation projects is regularly assessed and if incentives for top management are based on the innovation performance of the firm. We extended a scale for ‘top management accountability’ developed by Cooper and Kleinschmidt (1995) to measure the construct ‘incentives’. The informants rated the respective items on a five-point scale. The reliability coefficient Cronbach’s alpha for the construct ‘incentives’ based on informants from senior management and used for the testing of our hypotheses is .71 (see appendix).

Innovation Performance: Many suggestions have been made in the literature on how to measure the performance of innovations at the firm level (Griffin and Page, 1993). We followed the approach suggested by Cooper and Kleinschmidt (1995), who measure the performance of innovations at the firm level with a set of performance criteria. The knowledgeable respondents from the financial accounting department rated these items on a five-point scale. The final construct ‘innovation performance’ ($\alpha = .77$) consists of three items: ‘profitability of innovations relative to spending (ROI)’, ‘profit impact of innovations’ and ‘profitability of innovations relative to competitors’ with regard to all innovative projects completed or terminated within the last three years prior to the survey. We further correlated the construct ‘innovation performance’ with overall company performance, which was objectively measured by the firm’s operating profit margin for cross-validation purposes. The correlation coefficient is .47 ($p < .01$). This leads us to conclude that our subjective measure of innovation performance is meaningful for the purpose of this study.

Analyzing Multiple Informant Data

When empirical studies in organizational research are based on the perception of single informants within one organization, a systematic measurement error, a so-called method error or informant bias can occur (Bagozzi, Yi and Phillips, 1991; Kumar, Stern and Anderson, 1993). It has been recently shown that the informant bias is especially severe in empirical innovation research (Ernst, 2003). It is therefore recommended to use multiple informant data to control for informant effects on the validity of measures (Ernst, 2003). For this reason, data from multiple informants, representing different organizational positions, are used in this study to assess construct validity of the measures of the conceptual framework. If the valid measurement of the constructs cannot be achieved, our hypotheses cannot be tested (Bagozzi, Yi and Phillips, 1991).

Data from multiple informants allow the application of multitrait-multimethod (MTMM) analyses. The MTMM analysis was developed in order to test for the construct validity of latent variables (Campbell and Fiske, 1959). MTMM analysis makes it possible to break down the total variance into three components: (1) variance that can be explained by the constructs (trait variance), (2) method error and (3) random error. The extent of trait variance is particularly important for achieving construct validity. The trait variance can be obtained from squared factor loadings for the constructs (Bagozzi, Yi and Phillips, 1991). The factor loadings should be high and significant. Trait variance should exceed 50% of total variance in order to achieve a sufficient degree of construct validity (Bagozzi, Yi and Phillips, 1991; Kim and Lee, 1997). Due to the large number of constructs and the recommendation in the literature to conduct MTMM analyses with a maximum number of three to four traits (Conway, 1998), the constructs were split into two groups for the MTMM analyses. Group one contains the four types of culture and group two contains the remaining three constructs. In total, four MTMM analyses were performed.

RESULTS

Construct Validation

The data were first analyzed following the procedures suggested for carrying out an MTMM analysis (Bagozzi, Yi and Phillips, 1991, Conway, 1998; Kim and Lee, 1997). In an MTMM analysis, there are two steps of evaluation which must be carried out: First, in the scale purifi-

cation process, the constructs are tested in order to determine whether they are independent of the measurement methods, i.e. informants from the two hierarchical levels (senior management and project team) and informants with different functional backgrounds (R&D, marketing, and production). The scale purification process consists of a series of successive confirmatory factor analyses, depending on the different measurement methods. Results show that the construct 'market culture' cannot be measured independently of the three other culture types. Statistically, this effect is shown in the confirmatory factor analyses where factor loadings are also high for the other three constructs of organizational culture, thus leading to an insufficient reliability coefficient for the construct 'market culture' ($\alpha < .50$). This is not problematic because we only intend to test hypotheses for adhocracy and hierarchy cultures. All other constructs of the conceptual model required for hypotheses testing are independent of the measurement methods. The constructs, their respective measurement items and Cronbach's alpha coefficients after the scale purification are listed in the appendix.

Second, a test for construct validity was carried out for the method-independent constructs. Table 1 shows the results of two MTMM analyses for the culture constructs depending on the respective informant. In the first analysis, which is based on the hierarchical position of informants, the total trait variance amounts to 44%, which lies below the required threshold level of 50% (Bagozzi, Yi and Phillips, 1991). However, it is within the range of other rigorous empirical work using the MTMM approach (Kim and Lee, 1997). Whereas informants from the senior management level make a valid assessment of clan culture (trait variance = 55%), informants from the project level make a valid assessment of adhocracy culture (trait variance = 92%). However, it is problematic that neither informants from senior management nor from the project level assess hierarchy culture accurately (trait variance < 50%). An informant bias prevents a valid measurement of this type of culture based on informants from different hierarchical levels. This could be caused by an 'attributional bias' and the intensity of inter-hierarchical communication within firms (Ernst, 2003).

Table 1: Results of Construct Validation: Types of Organizational Culture

Measure	Trait	Method	Trait Variance	Method Variance	Error Variance
X ₁₁	.74*	.22	<u>.55</u>	.05	.40
X ₁₂	.45*	.14	.29	.02	.69
X ₂₁	.37*	.26*	.14	.07	.80
X ₂₂	.96*	.15	<u>.92</u>	.02	.06
X ₃₁	.58*	.37*	.34	.14	.53
X ₃₂	.63*	.19	.40	.04	.57
MTMM 1 (hierarchical position of informant): N = 129; $\chi^2(1) = .77$ (p = .38); GFI = .99; CFI = .99; AGFI = .99; Average trait variance = 44%					
X ₁₃	.32*	.10	.10	.01	.89
X ₁₄	.71*	.26	<u>.50</u>	.07	.43
X ₁₅	.75*	.08	<u>.56</u>	.01	.43
X ₂₃	.69*	.40*	.48	.16	.36
X ₂₄	.78*	.03	<u>.61</u>	.00	.39
X ₂₅	.63*	.19	.40	.04	.57
X ₃₃	.44*	.22	.19	.05	.76
X ₃₄	.74*	.13	<u>.55</u>	.02	.44
X ₃₅	.53*	.28*	.28	.08	.64
MTMM 2 (functional position of informant): N = 86; $\chi^2(15) = 22.63$ (p = .10); GFI = .95; CFI = .98; AGFI = .84; Average trait variance = 41%					
X _{ij} = ith 'trait' assessed by jth method; J = 5, where: 1 = Senior Management, 2 = Project Level, 3 = R&D, 4 = Marketing and 5 = Production; I = 3, where: 1 = Clan Culture, 2 = Adhocracy Culture and 3 = Hierarchy Culture; * Factor Loadings are at least significant at the .05 level; sufficient degrees of trait variance are highlighted.					

The second MTMM analysis considers the informants' different functional positions. Total trait variance is 41%. Informants from Marketing make a valid assessment of all three types of culture. Squared factor loadings reach or exceed 50% indicating a high degree of construct validity (Bagozzi, Yi and Phillips, 1991). The test of our hypotheses, therefore, will be based on the assessments of adhocracy and hierarchy cultures by respondents from Marketing.

Table 2 shows the results of two MTMM analyses for the remaining constructs depending on the respective informant. The insufficient levels of trait variances for all constructs in the fourth MTMM analysis indicate that they cannot be measured with a satisfactory degree of construct validity based on informants with one of the three functional backgrounds covered in this study. This can be caused by a low level of interdepartmental integration, which im-

pacts the validity of measures from informants from different functional departments in the same firm (Ernst, 2003). The constructs 'executive champion' and 'incentives' can be measured based on the assessments from informants from senior management (trait variance \geq 50%). The construct 'monitoring' can be measured based on the assessments from informants from the project level (trait variance = 50%). We are therefore able to test all hypotheses of our conceptual model based on valid measures for all constructs. If we had used single informants, we would have not been able to test our hypotheses (Bagozzi, Yi and Phillips, 1991).

Table 2: Results of Construct Validation: Executive Champion, Incentives and Monitoring

Measure	Trait	Method	Trait Variance	Method Variance	Error Variance
X ₁₁	.71*	.25	<u>.50</u>	.06	.44
x ₁₂	.40*	.46*	.16	.21	.63
x ₂₁	.80*	.55*	<u>.63</u>	.30	.05
x ₂₂	.27*	.60*	.08	.36	.57
X ₃₁	.52*	.86*	.27	.73	.00
X ₃₂	.70*	.37*	<u>.50</u>	.14	.37
MTMM 3 (hierarchical position of informant): N = 129; χ^2 (3) = 1.28 (p = .73); GFI = .99; AGFI = .93; Average trait variance = 38 %					
x ₁₃	.65*	.61*	.43	.37	.20
x ₁₄	.59*	.40*	.34	.16	.50
x ₁₅	.41*	.63*	.17	.40	.42
x ₂₃	.63*	.17	.39	.03	.57
x ₂₄	.59*	.18	.35	.03	.62
x ₂₅	.50*	.49*	.25	.24	.52
x ₃₃	.35*	.18	.12	.03	.84
x ₃₄	.63*	.41*	.39	.17	.45
x ₃₅	.44*	.56*	.19	.31	.50
MTMM 4 (functional position of informant): N = 86; χ^2 (7) = 14.27 (p = .52); GFI = .99; AGFI = .90 Average trait variance = 29 %					
X _{ij} = ith 'trait' assessed by jth method; J = 5, where: 1 = Senior Management, 2 = Project Level, 3 = R&D, 4 = Marketing and 5 = Production; I = 3, where: 1 = Executive Champion, 2 = Incentives and 3 = Monitoring; * Factor Loadings are at least significant at the .05 level; sufficient degrees of trait variance are highlighted.					

Testing of Hypotheses

To test our first two hypotheses, we conducted a correlation analysis between the two types of culture and the existence of executive champions. Table 3 summarizes the results. The findings indicate that executive champions are to be found significantly more often in firms that have an innovation-friendly adhocracy culture. On the contrary, executive champions significantly less frequently occur in innovation-unfriendly hierarchy cultures. Hypothesis H₁ is confirmed and hypothesis H₂ is rejected by the data. We have clear evidence that the emergence of executive champions is facilitated by the environment they operate in their organizations. Clearly, the emergence of executive champions is supported by a culture that is conducive to innovation. Hierarchy cultures prevent the emergence of champions at the executive level to support innovations.

Table 3: Results of Correlation Analysis between Types of Organizational Culture and the Emergence of Executive Champions

	Executive Champion	Adhocracy Culture
Adhocracy Culture	.32**	
Hierarchy Culture	-.46***	-.73***
Levels of Significance: *** = $p < .01$; ** = $p < .05$; $n = 43$; Spearman correlation analysis; non parametric correlation analysis leads to the same results.		

The scatter plot indicates a non-linear, inverted u-shaped relationship between the level of executive champion activity and innovation performance. Testing the significance of non-linear effects in a regression analysis leads to inflated standard errors due to the collinearity between interaction term and main effect. Thus, the interaction term is entered as an orthogonalized effect (Aiken and West, 1991). This approach yields an interaction variable that is uncorrelated with its component variable and enables the assessment of the ‘true’ effects of the interaction. Table 4 shows the results of the stepwise multiple regression analysis with all elements of the conceptual model to test the hypotheses three to seven (figure 1).

Table 4: Results of Multiple Regression Analyses

<i>Dependent Variable: Innovation Performance</i>	Regression Coefficient	Standard Error	Beta	Significance	VIF
Executive Champion × Execu- tive Champion	.30	.07	.54	.00	1.20
Executive Champion × Incen- tives	.09	.04	.28	.03	1.32
Executive Champion × Hier- archy Culture	-.04	.002	-.25	.04	1.19
R ² = .53; F = 16.67 (p = .00); n = 43; the results for the moderated constructs 'executive champion × adhocracy culture' and 'executive champion × monitoring' are not significant.					

The regression model explains 53% of total variance, which shows that executive champions have a strong impact on the performance of innovations. The significant and non-linear, inverted u-shaped relationship between executive champions and innovation performance confirms our hypothesis H₃. Executive champions have a positive and a negative impact on innovation performance. On the one hand, executive champions help innovations to succeed through their commitment and the allocation of required resources. On the other hand, strong support from executive champions reduces the probability that projects are terminated (Boulding, Morgan and Staelin, 1997; Markham, 2000). If executive champions back unprofitable, often prestigious and large projects, which are often referred to as the 'pet projects of the CEO or other members of the board of directors', lower performance of the entire innovation portfolio is inevitable. This effect was often mentioned in discussions with managers from the firms in our sample. Obviously, an optimal level of championing activity at the executive level exists. For the first time we have accurate empirical evidence that we have to rethink the role of champions in innovation processes. We cannot assume by default that championing at the executive level is always beneficial to the performance of innovations.

Table 4 further summarizes the impact of the four moderating variables. As expected, the construct 'incentives' positively moderates the relationship between executive champions and innovation performance. Hypothesis H₅ is therefore confirmed by the data. Innovation-related accountability of executives has a significant and positive effect on the impact of championing at the executive level on innovation performance. This type of incentives can obviously avoid the negative impact of strong executive champions on overall innovation performance. At the same time, we find a positive, however not significant moderating effect of the construct 'monitoring'. Hypothesis H₄ is therefore not confirmed by the data. Obviously, the es-

establishment of innovation process monitoring activities does not offset the negative impact of strong executive champions. It appears that executive champions, because of their very strong hierarchical power base, can either influence the existing controlling mechanisms or prevent projects from being terminated, although this should be done according to the existing performance data. The best way to counter-balance the negative impact of executive champions on innovation performance seems to be via an explicit incentive structure that leads executive champions to terminate unpromising projects themselves to receive higher personal rewards.

The moderating effect of the construct 'hierarchy culture' is significant. Strong executive champions in innovation-unfriendly cultures have a negative impact on innovation performance. Hypothesis H₆ is rejected by the data. Contrary to the common belief, executive champions are less beneficial to the success of innovations in environments characterized by strong barriers and resistance to change and innovation. Executive champions are able to keep projects alive, however, these projects won't become successes from an economic point of view. This result shows that executive champions need a supportive organization to achieve successful innovation; they cannot push through innovations in organizations with innovation-unfriendly cultures.

At the same time, we observe that the moderating effect of the construct 'adhocracy culture' on the impact of executive champions on innovation performance is positive, however, it is not significant. Hypothesis H₇ is therefore not confirmed by the data. Executive champions must not necessarily have a stronger effect on innovation performance in innovation-friendly cultures either. It could be in this case that too much championing in adhocracy cultures leads to a downplaying of risks, which may, subsequently, cause the pursuit of too many risky innovation projects that will, eventually, fail. These failures have a negative impact on the average performance of the total number of innovation projects. A high level of championing in adhocracy culture may also result in a large number of innovation projects that are executed simultaneously in the organization. However, the portfolio of innovation projects needs to be managed in order to maximize its impact on company performance. Good portfolio management also includes the termination of unpromising projects (Cooper and Kleinschmidt, 1995). The existence of strong executive champions has the effect that termination decisions are disregarded (Markham, 2000). Consequently, too many projects with unsatisfactory returns reach the market leading to a lower performance of the firm's entire innovation portfolio. Independent of the type of culture, our data clearly suggest that incentives for executive champions tied

to the achievement of innovation-related performance criteria can avoid the negative impact of executive champions on innovation outcome.

DISCUSSION

The key findings of the empirical analyses can be summarized as follows: First, executive champions emerge in environments that are supportive to innovations. The commonly held believe that champions emerge in environments that are characterized by strong resistance against innovations is rejected by our data. There are many possible explanations for this result. It could be that executive champions emerge more often in innovation-friendly adhocracy cultures because they have a larger pool of innovative ideas from which they can pick the most promising ones to champion them. A further explanation could be that executive champions do not champion innovations in innovation-unfriendly cultures because they anticipate that it is difficult or even unlikely to successfully implement the innovation due to insufficient innovative understanding and capabilities in the organization. Further, since executive champions are also part of the firm's culture, top managers in firms with strong hierarchy cultures may not value innovation high enough to champion them.

Second, if executive champions emerge in unfavorable environments for innovation, they have a particularly negative impact on innovation performance. Our results suggest, in sharp contrast with the existing theory of champions, that executive champions require a supportive organization to lead innovation projects to a commercial success. Executive champions can keep innovation projects alive, they can secure the necessary resources, however, they cannot successfully push through an innovation against the believes of the organization. In these situations the danger arises that fully dedicated executive champions waste substantial resources in a losing course of action, which has a detrimental effect on the overall performance of the firm's entire innovation portfolio.

Third, executive champions can have a positive and at the same time also a negative impact on innovation performance. The relationship between the level of activity of executive champions and innovation performance is inverted u-shaped. This result confirms the core hypothesis of this study. The inherent characteristics of champions cause both effects: On the one hand, the commitment of executive champions and their strong hierarchical power base block opposition against the innovation, secure the required resources, achieve the optimal

organizational support and keep the projects from early termination. This is the positive side of champions as described in earlier case studies (Chakrabarti, 1974; Day, 1994; Frey, 1991; Schon, 1963). Now we have rigorous empirical evidence for this commonly held belief. On the other hand, the strong dedication of executive champions to their pet projects can lead to the escalation of commitment to a failing course of action. The capability of executive champions to keep the project from being terminated and to secure the investment of further resources into a failing project (Markham, 2000) has a negative impact on innovation performance. The negative effect of executive champions on innovation performance is further enhanced by increased opportunity costs, if resources are diverted from a more promising to the failing innovation project. This is the dark side of championing. The activity of executive champions alone explains 36% of total variance in the regression model. The very strong impact of champions on innovation performance must lead researchers to look for strategies, which effectively reduce escalation of commitment and optimize the impact of executive champions on innovation outcome.

Fourth, we find evidence in the data that incentives for executive champions, which are based on the performance of the firm's entire innovation portfolio, decrease the escalation of commitment to a failing project. Incentives positively moderate the impact of executive champions on innovation performance. Incentives obviously impact behavior of executive champions to such an extent that they are less likely to continue championing a failing project. By contrast, the existence of decision aides and procedures to provide more and better-structured information to evaluate projects along the innovation processes does not moderate the impact of executive champions on innovation performance. We can therefore not confirm the assumption made in the literature on escalation of commitment and the empirical results of a former study in the context of managing innovations (Boulding, Morgan and Staelin, 1997). It appears that executive champions either disregard, misinterpret or even manipulate this information. Their hierarchical power base allows executive champions to exert a strong influence on how this information is gathered, interpreted and used.

Some limitations of the present study should be emphasized, which open up further research opportunities: First, this study does not answer the question, why executive champions emerge in adhocracy cultures. We have offered some potential causes, which need further empirical testing. Second, we did not analyze how executive champions impact the moderating variables. Of further interest in this context could be, for example, to examine how execu-

tive champions bypass monitoring systems installed in the organization and why they do not influence the way incentives are set? Third, we had to restrict the analyses to a number of moderating variables. The identification and empirical test of further moderators, for example, internal moderators such as the role of cross-functional teams and their participation in decision making and external moderators such as customer integration, is promising in order to further enhance our knowledge on how to make sure that the potential of executive champions is used to optimally impact innovation performance. Fourth, we focused on executive champions because of their high impact in innovation processes. We suggest to further extend this research approach to other championing roles and to explicitly address the interaction between multiple champions.

Fifth, the empirical analyses are based on a relatively small sample of firms due to the chosen data collection procedure from multiple informants in the respective firms. This may raise concern regarding the validity and generalizability of results. The thorough collection of complete multiple informant data in close cooperation with firms is considered to be superior for this type of research over a less thorough approach aiming to maximize the sample size (Brown and Eisenhardt, 1995). The rigorous establishment of construct validity of the measures of the conceptual model by means of MTMM analyses justifies strong confidence in the empirical findings. Empirical studies based on single informants cannot test for measurement error caused by varying informants and thus one cannot be sure that “a hypothesis is rejected or accepted because of excessive error in measurement and not necessarily because of the inadequacy or adequacy of theory“ (Bagozzi, Yi and Phillips, 1991: 422). Furthermore, the sample represents the typical structure of the German manufacturing industry as indicated by comparable average R&D intensities as percent of sales between the sample firms and the overall population of German manufacturing firms. Thus, the findings should not be distorted by one dominant industrial sector. Further, the results are highly significant suggesting that the findings of this study have generalizable implications for managing innovation in various industries. However, pharmaceutical, biotechnology and software firms as well as recently founded start-up firms are not included in the sample. The findings may thus not hold for these firms and it may be worthwhile to conduct similar research on the relationship between executive champions and innovation performance in these areas.

CONCLUSION

The findings of this study lead us to fundamentally rethink the existing common understanding about the emergence of champions and their impact on innovation performance. The old and dominating belief that champions emerge and are particularly effective in hostile environments characterized by strong resistance to change and innovation is obsolete. Champions emerge in environments, which are conducive to innovation and their occurrence in environments that are unsupportive to innovation causes the opposite to what previous research has claimed: i.e. innovation performance declines. Where there is light, there is also shadow: the inherent characteristics and activities of champions strongly increase and decrease innovation performance at the same time. The attention of academics and managers must therefore shift towards the identification of factors, which positively moderate the impact of champions on innovation performance. One effective strategy to achieve this objective is the introduction of incentive systems in the organization, which base rewards for champions on innovation performance. This allows organizations to fully leverage the positive and strong impact of champions on the success of innovations.

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APPENDIX: Items, Constructs and Reliability after Scale Optimization

Executive Champions^a ($\alpha_{SM} = .75$; $\alpha_{PT} = .72$; $\alpha_{RD} = .73$; $\alpha_{MA} = .73$; $\alpha_{PD} = .81$)

- Top management^b is highly committed to innovations.
- Top management provides the required R&D budget for innovation projects.
- Top management provides additional financial resources (e.g. expenses for market research or product launch) for innovation projects if required.

Hierarchy Culture^c ($\alpha_{SM} = .90$; $\alpha_{PL} = .83$; $\alpha_{RD} = .83$; $\alpha_{MA} = .85$; $\alpha_{PD} = .86$)

- Leaders are considered as coordinators and administrators (category 2)
- Bonding occurs through formal rules and procedures (category 3)
- Strategic emphasis is on predictability and stability (category 4)

Adhocracy Culture^c ($\alpha_{SM} = .69$; $\alpha_{PL} = .82$; $\alpha_{RD} = .76$; $\alpha_{MA} = .75$; $\alpha_{PD} = .76$)

- Dominant values are dynamism, entrepreneurship and risk taking (category 1)
- Leaders are considered as entrepreneurs, innovators and risk takers (category 2)
- Bonding occurs through a strong shared commitment to innovation (category 3)

Monitoring ($\alpha_{SM} = .74$; $\alpha_{PT} = .73$; $\alpha_{RD} = .67$; $\alpha_{MA} = .69$; $\alpha_{PD} = .77$)

- Innovation projects are usually assessed at defined milestones along the entire innovation process.
- Innovation projects are usually assessed in comparison to pre-specified targets at defined milestones.
- Innovation projects are usually assessed by an institutionalized body in the organization (e.g. a steering committee)

Incentives ($\alpha_{SM} = .71$; $\alpha_{PT} = .67$; $\alpha_{RD} = .82$; $\alpha_{MA} = .67$; $\alpha_{PD} = .67$)

- The financial performance of innovations is regularly and systematically evaluated.
- Rewards or other compensations for top management are based on the accomplishment of financial performance targets for innovations.

^a Informants came from: SM = Senior Management, PT = Project Team Members, RD = Research & Development, MA = Marketing, PD = Production (α = Cronbach's alpha)

^b The meaning of 'top management' was further specified in the questionnaire: a) top management referred to the highest hierarchical level in the firm, i.e. the board of directors; b) 'top management' referred to at least one member of the board of directors championing an innovation.

^c The sentences posed in the questionnaire to measure culture were shortened for the appendix, however, the core content is shown.

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