Preparedness for the future in project portfolio management: The roles of proactiveness, riskiness and willingness to cannibalize

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Abstract

Because of the lack of research on antecedents of preparedness for the future in project portfolio management, the present study investigated associations between this previously neglected criterion and two predictor variables, namely the quality of portfolio management and proactiveness. Drawing from models of organizational culture and entrepreneurial orientation, we additionally explicated three interaction hypotheses modeling willingness to cannibalize, proactiveness and risk taking as moderators of the relationship between management quality and preparedness for the future. Field survey data were collected from two different rating sources in 165 organizations within four countries. As anticipated, both management quality and proactiveness were positively and significantly associated with preparedness for the future. All of the three interaction hypotheses involving the dimensions of entrepreneurial orientation and organizational culture as moderators received support. As hypothesized, management quality was positively related to future preparedness when willingness to cannibalize was high, proactiveness was high or riskiness was low.

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1. Introduction

Since about 2000, business scholars have devoted increasing attention to the pivotal roles of future orientation and proactivity in various domains such as project management, innovation, entrepreneurship, strategic management and organizational behavior (Covin and Lumpkin, 2011; Crant, 2000; Danneels and Sethi, 2011; Kreiser et al., 2010a; Lumpkin and Dess, 2001; Parker et al., 2006; Rank et al., 2007; Rohrbeck and Gemünden, 2010; Shenhar et al., 2001; Tellis et al., 2009; Williams et al., 2010). Although the construct of proactiveness, for example, has been featured as a dimension of strategic or entrepreneurial orientation since the 1970s (Covin and Slevin, 1989; Khandwalla, 1976; Miles and Snow, 1978; Mintzberg, 1973; Venkatraman, 1989), empirical research on its antecedents and outcomes has begun to flourish again recently (Kreiser et al., 2010a, 2010b; Talke, 2007a; Talke and Hultink, 2010; Tang et al., 2010). Likewise, while willingness to cannibalize had been introduced as a corporate culture construct to the innovation realm in the 1990s (Chandy and Tellis, 1998), studies on its relationships with various predictors and criteria have mostly appeared in the past few years (Danneels, 2008; Danneels and Sethi, 2011; Nijsen et al., 2005; Tellis et al., 2009).

In a similar vein, project management researchers have also placed an increasing emphasis upon future-oriented issues since Shenhar et al. (2001) introduced preparedness for the future as a success criterion for the management of individual projects. Building on their work, Meskendahl (2010) expanded this construct by arguing that future preparedness functions as an important outcome not only for single projects, but also at the project portfolio level. In the present study, preparedness for the future in project portfolio management serves as the main

dependent variable. In the context of multiproject management, Teller and Kock (2013, p. 820) included future preparedness as a success criterion at the portfolio level and described this outcome variable as follows: “Preparing for the future deals with the long-term aspects and considers the ability to seize opportunities that arise after the projects have been brought to an end”. According to Shenhar and colleagues (Shenhar and Dvir, 2007; Shenhar et al., 2001), future preparedness may relate to the creation of new markets, the development of new or improved technologies and processes, the building of new skills and competencies and the capability to react to external challenges such as technology or market changes (Meskendahl, 2010; Rohrbeck and Schwarz, 2013). Recently, Maltz et al. (2014) argued that preparing for the future constitutes the longest-term success factor not only at the single project level, but also at higher business unit and corporate levels. However, firm-level research on this future-oriented outcome within the context of multi-project management is in its nascent stage, as business scholars have begun only recently to discuss future preparedness as a success factor for the management of complex project portfolios (Meskendahl, 2010; Teller and Kock, 2013). Integrating these disjointed streams of research on future-oriented organizational culture, entrepreneurial orientation and project management constructs, the present study incorporates variables from all of these three domains.

Drawing on Schein’s (1990, 1996, 2010) theory of organizational culture and prior conceptual work on relevant dimensions of corporate innovation culture as well as entrepreneurial or strategic orientation (Chandy and Tellis, 1998; Covin and Lumpkin, 2011; Danneels and Sethi, 2011; Lumpkin and Dess, 1996, 2001), we generate and test a novel set of hypotheses explicating the role of three culture-related constructs (willingness to cannibalize, proactiveness and riskiness) within the new context of project portfolio management. To date, relatively little research has applied these organizational dimensions to the realm of portfolio management or examined the moderating effects of these constructs on the associations between managerial input and organizational outcome variables (Meskendahl, 2010; Tang et al., 2010). For example, although Meskendahl (2010) proposed that strategic orientations such as risk taking may moderate the association between project portfolio structuring and success, little empirical research has substantiated such theoretical claims. A few promising studies in domains other than project portfolio management (e.g., Atuahene-Gima and Ko, 2001; Tang et al., 2010) revealed significant moderating effects of strategic orientations including proactiveness and risk taking, thus suggesting that such variables may also play a moderating role in the context of project portfolio management. Therefore, the major objective of this study is to investigate the three previously mentioned culture-related organizational constructs as moderators of the relationship between the management quality related to project portfolios (Jonas et al., 2013) and preparedness for the future in project portfolio management (Teller and Kock, 2013).

In addition to our first and main goal of examining such moderating effects, the present study also pursues two additional aims: our second aim is to examine more simple direct associations between the two independent variables management quality as well as proactiveness (Kreiser et al., 2010b; Talke, 2007a, 2007b) and future preparedness. Because of the practical importance and the lack of prior investigations of future preparedness in multi-project management (Teller and Kock, 2013), it is critical that both simple main effects and more complex moderating effects are detected. Although a few recent studies incorporated items pertaining to future preparedness in composite measures of project portfolio success (Teller and Kock, 2013), almost no research has explicitly focused on this criterion or examined its unique antecedents compared to other success facets such as portfolio synergy (Cooper et al., 1999; Jonas et al., 2013; Meskendahl, 2010). Therefore, our third and final aim is to demonstrate the specific applicability of our research model for the prediction of future preparedness as compared to the more traditional success factor portfolio synergy. Such cross-project synergies may relate to technologies, marketing, knowledge or resources and evolve when the coordinated management of multiple projects within a portfolio delivers benefits beyond the results of independently managed projects (Meskendahl, 2010; Platje et al., 1994). Although we acknowledge that management quality may also be relevant to portfolio synergy, we argue and demonstrate that proactiveness is more critical to future preparedness and that the predicted moderating effects apply uniquely to this success criterion.

1.1. Contributions of the present study

Overall, the present research contributes to the literature on project management, organizational culture and entrepreneurial orientation in three meaningful ways: First, we integrate relevant constructs from these largely disjointed domains and assess differential effects of the three organizational dimensions, namely willingness to cannibalize, proactiveness and riskiness, thus demonstrating the recently emphasized value of separately considering such constructs (Kreiser et al., 2010b; Tellis et al., 2009) within the new context of project portfolio management. Almost no research to date has simultaneously considered the relevant factors from both the corporate innovation culture model (Tellis et al., 2009) and from frameworks of entrepreneurial or strategic orientation (Covin and Lumpkin, 2011; Lumpkin and Dess, 1996, 2001; Venkatraman, 1989). Among the six attitudes and practices included in the model and measure of corporate innovation culture (Chandy and Tellis, 1998; Tellis et al., 2009), willingness to cannibalize appears to bear the strongest conceptual relevance to future-oriented outcomes and has received the greatest theoretical and empirical attention, particularly in recent years (e.g., Danneels, 2008; Danneels and Sethi, 2011; Nijssen et al., 2005).

Among the various dimensions considered in models of entrepreneurial orientation (Covin and Lumpkin, 2011), strategic orientation (Venkatraman, 1989) or the corporate mindset (Talke, 2007a, 2007b; Talke and Hultink, 2010), proactiveness and riskiness or risk taking have been identified as two different key dimensions (Kreiser et al., 2010b). In a study of more than 1000 companies in six countries, Kreiser and associates (2010b) recently presented confirmatory factor analytic evidence of a two-dimensional solution featuring proactiveness and risk taking as separate factors and identified differential country-level predictors.
of these two factors of a firm’s entrepreneurial orientation. For example, the cultural value of individualism was related negatively and significantly to proactiveness but not to risk taking. Furthermore, high levels of political risk and either low or high GDP scores were associated with proactiveness, whereas moderate levels of political risk and low GDP scores were linked to riskiness (Kreiser et al., 2010b). Our study complements such country-level investigations of the distinctive antecedents of these two entrepreneurial orientation factors by proposing and demonstrating some of their differential direct and moderating organizational-level effects.

Second, our study is one of the first to focus explicitly on preparedness for the future, a previously largely neglected success criterion within project portfolio management, thus providing much-needed knowledge of its predictor variables. Compared to single projects with a definitive end and success criteria related to time, budget and quality, project portfolios represent long-term organizational features with distinct success criteria. In addition to more traditional project portfolio objectives such as maximizing the value of the portfolio, linking the portfolio to the firm’s strategy, balancing the portfolio and establishing synergy (Cooper et al., 1999), preparedness for the future has recently been introduced as an important complementary success criterion (Meskendahl, 2010; Teller and Kock, 2013). Management procedures typically take some time to reveal their potential, but may be crucial for project portfolio success (Jonas et al., 2013). Our main predictor of preparedness for the future is the construct of management quality, which “allows the anticipation of project portfolio success much earlier than the time at which established success criteria become measurable” (Jonas et al., 2013, p. 215). Additionally, we identify willingness to cannibalize, proactiveness and riskiness as moderators of the relationship between management quality and future preparedness, thus demonstrating that management quality needs to be complemented by a conducive corporate culture and entrepreneurial orientation features.

Third and finally, by contrasting the unique results regarding preparedness for the future with those concerning a second substantively distinctive criterion (i.e., portfolio synergy), we provide evidence regarding the differential validity of our model in relation to proactive as opposed to less proactive outcomes (Parker et al., 2006; Rank et al., 2007). The exploitation of synergies between several projects within one portfolio implies that “cross-project coordination generates value that is greater than the sum of the results delivered by the individual projects of a portfolio” (Jonas et al., 2013, p. 219). For example, portfolio synergies may result in shared technology platforms or market synergies such as the combined exploitation of multiple project results (Jonas et al., 2013). Meta-analytic evidence demonstrated a positive association between the utilization of technology as well as market synergies on the one hand and project success on the other hand (Pattikawa et al., 2006).

Within the domain of organizational behavior, several authors have contrasted distinctive relationships of specific micro-level predictor variables with proactive as opposed to more passive criteria such as proactive problem solving and idea implementation versus generalized compliance (Parker et al., 2006) or proactive customer service performance versus prescribed routine task performance (Rank et al., 2007). For example, these studies demonstrated that certain cognitive-motivational predictors (e.g., role-breadth self-efficacy, i.e., the belief in one’s capability to successfully carry out a wide range of work-related activities; Parker et al., 2006) as well as situational–environmental predictors (e.g., participative leadership, task complexity; Rank et al., 2007) yielded unique significant associations with the proactive as opposed to the less proactive outcomes. Similarly, we propose that the organizational-level proactivity variable proactiveness relates more strongly to our explicitly proactive criterion (i.e., preparedness for the future) as compared to the less proactive outcome (i.e., portfolio synergy). Furthermore, we suggest that interaction effects involving future-oriented moderator variables such as willingness to cannibalize (Chandy and Tellis, 1998; Danneels and Sethi, 2011) apply uniquely to future preparedness as opposed to portfolio synergy. Therefore, we complement micro-level theory and research by suggesting and demonstrating the value of developing and testing conceptually grounded models tailored explicitly to the prediction of proactive corporate-level variables such as preparedness for the future in project portfolio management.

1.2. Research model and overview

Fig. 1 is an illustration of the research model of the present study and includes a depiction of the five hypotheses, which are developed in the subsequent sections. Each of the variables included in the model is also defined in the following paragraphs. First, management quality in project portfolio management as well as proactiveness are modeled as positive predictors of preparedness for the future as well as portfolio synergy, although proactiveness is expected to more strongly predict the former criterion. Second, we hypothesize moderating effects of the three variables willingness to cannibalize, proactiveness and risk taking on the relationship between management quality and future preparedness (but not synergy). Specifically, the former two moderators are expected to enhance this relationship, whereas the latter moderator is expected to reduce this association. Each of the variables and hypotheses from the research model is now explained in detail.

2. Theory and hypotheses

2.1. Management quality as a predictor

Within contemporary project portfolio management research (Jonas et al., 2013; Unger et al., 2012), information quality, allocation quality, cooperation quality and termination quality together are modeled as dimensions of management quality in project portfolios. These factors reflect the execution quality of processes that take place during the steering and management of project portfolios. Jonas et al. (2013) introduced the superordinate construct of management quality in project portfolio management, which is composed of several process variables such as the transparency and ease of information exchange, the prompt and adequate allocation of resources and the extent of cooperation
among management roles across projects. Specifically, information quality reflects the degree of excellence to which information transparency (in terms of accuracy, reliability, and actuality) is delivered by project portfolio management processes. Second, allocation quality represents the degree of excellence to which resources (especially human resources) are allocated between projects as a result of project portfolio management processes. Third, cooperation quality is a measure of the degree of excellence to which different management roles (in terms of cross-project cooperation and the sharing of information) work together supportively in project portfolio management, while driving their individual projects. As Jonas et al. (2013) proposed, excellent project portfolio management encompasses effective behaviors related to all of these three management quality dimensions.

Beyond these three dimensions of project portfolio management quality, Unger et al. (2012) additionally argued for a critical type of decision-making quality, namely termination quality, defined as the degree of excellence to which inappropriate single projects (e.g., those with poor strategic fit, return on investment or purpose delivery) are aborted as a result of project portfolio management processes. In concordance with previous findings (Jonas et al., 2013; Unger et al., 2012), the combination of these project portfolio management qualities is expected to be positively associated with both preparedness for the future and portfolio synergy in the present research. For example, Jonas et al. (2013) employed a longitudinal research design to demonstrate a significant positive cross-lagged influence of management quality on project portfolio success, a second-order construct comprising several criteria including the exploitation of synergies. Similarly, we anticipate positive relationships between management quality and both criterion variables.

**Hypothesis 1.** Management quality will be positively associated with preparedness for the future and portfolio synergy.

### 2.2. Proactiveness as a predictor

Proactiveness as a dimension of a firm’s entrepreneurial or strategic orientation (Lumpkin and Dess, 1996; Venkatraman, 1989) reflects a forward-looking and opportunity-seeking perspective characteristic of a market leader and implies that organizations exhibit the foresight to act in anticipation of future demand by exploring and exploiting emerging opportunities and by shaping their environment (Lumpkin and Dess, 2001; Talke, 2007a; Talke and Hultink, 2010; Venkatraman, 1989). Lumpkin and Dess (2001) described proactiveness as a response to opportunities, noting that it involves taking initiative in an effort to influence one’s environment to one’s own advantage. For example, organizations high in proactiveness may introduce new products ahead of competitors, seek new opportunities related or unrelated to the present line of operations and strategically eliminate operations in the mature or declining stage of the life cycle (Lumpkin and Dess, 1996; Venkatraman, 1989). As Kreiser et al. (2010b) emphasized, proactiveness is centered on the exploitation of environmental opportunities and the achievement of a company’s objectives by any means necessary. On the contrary, the opposite of proactiveness is passiveness, defined as “indifference or an inability to seize opportunities or lead in the marketplace” (Lumpkin and Dess, 1996, p. 147).

Meta-analytic research on the link between entrepreneurial orientation and business performance identified a positive and significant .18 mean correlation between proactiveness and business performance (Rauch et al., 2009). In particular, previous studies found proactiveness to be positively associated with future-related outcomes such as firms’ perceptions of environmental opportunities and sales growth (Kreiser et al., 2010a; Lumpkin and Dess, 2001). Furthermore, recent research demonstrated that firms high in proactiveness place greater emphasis on in-house innovation generation rather than the adoption of externally developed innovations (Luno-Perez et al., 2011). Among several different components of the so-called corporate mindset construct for innovation (Talke, 2007a), proactiveness yielded the strongest positive weight within a market-oriented corporate mindset construct that was substantially associated with the financial performance of new products.

Proactiveness should be conducive to both future preparedness and synergies within project portfolios, because it enables organizations “to not only identify future opportunities, but also to actively create opportunities that did not previously exist” (Kreiser et al., 2010a). Obviously, proactiveness is critical to preparedness for the future, which implies that the set of projects puts the company one step ahead of its competitors in terms of new products, services or technology and that it allows the company to help shape the future of its industry (Teller and Kock, 2013). Additionally, because firms high in proactiveness tend to seek new environmental opportunities (Kreiser et al., 2010a; Lumpkin and Dess, 1996), they are more likely to identify and exploit technological or market-related synergies across projects (Jonas et al., 2013). For example, firms focusing on emerging opportunities...
may be more likely to combine project results in order to shape the development of technologies or market trends. Therefore, proactiveness is hypothesized to relate positively to future preparedness and portfolio synergy, although it is expected to be more directly relevant to the former criterion.

**Hypothesis 2.** Proactiveness will be positively associated with preparedness for the future and portfolio synergy.

### 2.3. Development of moderator hypotheses

In terms of Schein’s theory of organizational culture (1990, 1996, 2010), culture-related constructs reflect taken-for-granted assumptions, learned responses and typical approaches to tasks or challenges. In general, Schein defined culture as “(a) a pattern of basic assumptions, (b) invented, discovered, or developed by a given group (c) as it learns to cope with its problems of external adaptation and internal integration (d) that has worked well enough to be considered valid and, therefore (e) is to be taught to new members as the (f) correct way to perceive, think, and feel in relation to those problems” (p. 111). Operating at the three levels of artifacts, espoused values and basic underlying assumptions, organizational culture dimensions influence a wide range of outcomes including verbal behavior, typical ways of solving new tasks and automatic taken-for-granted reactions to repeatedly experienced problems (Schein, 2010). For example, Schein (1990) described features of the culture of a high-technology manufacturing firm in the US including high levels of informality as well as confrontation in verbal behavior, the espoused belief that failure should lead to new assignments rather than punishment and the basic assumption that debate and conflict are necessary to identify and implement the best ideas.

When applying Schein’s (1990, 2010) terms to project portfolio management, internal integration implies that an organization should develop consensus on how members deal with each other internally within and across projects, whereas external adaptation implies that an organization must develop consensus on how to adapt its portfolio management endeavors to its environment. Culture-related issues such as willingness to cannibalize may substantially determine how these forms of consensus will be developed and enacted. Based on their culture-centric innovation theory, Tellis et al. (2009) defined corporate culture as “a core set of attitudes and practices that are shared by the members of the firm” (p. 6). Willingness to cannibalize, one of the six culture factors included in their model, reflects “an attitude that puts up for review and sacrifice current profit-generating assets, including current profitable and successful innovations, so that the firm can get ahead with the next generation of innovations” (Tellis et al., 2009, p. 8). In their large-scale study of more than 750 firms in 17 countries, willingness to cannibalize emerged as one of the strongest corporate culture predictors of radical innovation and proved to be considerably more relevant than firm size.

Several authors (Chandy and Tellis, 1998; Danneels, 2008; Danneels and Sethi, 2011) have described this dimension as the extent to which members of a company are prepared to reduce the actual or potential value of their investments in organizational assets, competencies, resources or routines. This cultural dimension encourages organization members to typically deal with problems and tasks by letting go of past resources and by exploring new technologies, markets and products (Danneels, 2008; Danneels and Sethi, 2011; Nijssen et al., 2005). On the contrary, a firm low in willingness to cannibalize will program its members to hold on to existing investments and “will force-fit its products so that they are based on its current resources and competencies” (Danneels and Sethi, 2011, p. 1028). Willingness to cannibalize is conducive to the development of explorative new products, particularly in environments with high levels of customer turbulence (Danneels and Sethi, 2011). On the basis of dynamic capability theory, Danneels (2008) demonstrated that willingness to cannibalize facilitates the development of second-order competencies related to the abilities to explore new markets and technologies.

Only a few studies to date have incorporated willingness to cannibalize or proactiveness as moderating variables enhancing relationships between beneficial situational factors and success-related criteria. One exception is a study of more than 200 firms in four countries (Tang et al., 2010), which identified proactiveness as a positive moderator of the relationship between objective industrial munificence and perceived munificence, hence suggesting that the same industry-related environment may lead to greater subjective perceptions of environmental opportunities among members of highly proactive organizations. Another recent study revealed an interaction effect between a different environmental factor, namely customer turbulence, and willingness to cannibalize (Danneels and Sethi, 2011), demonstrating that a combination of high levels of both variables most positively related to the development of explorative new products.

Willingness to cannibalize and proactiveness may enhance the positive association between management quality and future preparedness, as they represent complementary facets of an organization’s future orientation (i.e., the propensity to abandon past approaches versus the proclivity to act in anticipation of future change; Lumpkin and Dess, 1996; Tellis et al., 2009). Organizations high in proactiveness or willingness to cannibalize may capitalize on superior management processes by channeling qualities related to cooperation, information, allocation and termination into future preparedness. For example, in a firm high in willingness to cannibalize, organization members will entertain assumptions and values prompting them to utilize such management qualities by abandoning past resources and developing new competencies. Similarly, in a firm high in proactiveness, organization members’ opportunity-seeking perceptions and change-inducing actions (Lumpkin and Dess, 2001) will enable them to use management qualities as a means to achieve high levels of future preparedness. On the contrary, organizations lacking a future-oriented culture may develop complacency and focus on the efficiency of current practices and routines. In such firms, management quality may be used mainly for exploitation rather than exploration activities (Uotila et al., 2009). Therefore, management qualities will likely predict preparedness for the future in project portfolio management more strongly and positively when such qualities are complemented by high levels of proactiveness or willingness to cannibalize.
Hypothesis 3. Willingness to cannibalize will moderate the association between management quality and preparedness for the future such that this relationship will be stronger and more positive when willingness to cannibalize is high rather than low.

Hypothesis 4. Proactiveness will moderate the association between management quality and preparedness for the future such that this relationship will be stronger and more positive when proactiveness is high rather than low.

Riskiness refers to an organization’s “affinity of venturing into the unknown or committing significant resources to uncertain projects” (Talke, 2007a, p. 80), thus potentially attenuating the positive link between management quality and preparedness for the future. Specifically, Talke (2007b) noted that riskiness comprises a propensity to venture into new markets, to follow uncertain market trends and to focus on a single new technology rather than pursuing several technological developments simultaneously. Within theoretical and empirical work on entrepreneurial orientation (e.g., Kreiser et al., 2010b; Lumpkin and Dess, 1996), the similar construct of risk taking has been described as the extent to which managers are willing to engage in large and risky resource commitments including those with a reasonable chance of costly failure. “Thus, firms with an entrepreneurial orientation are often typified by risk-taking behavior, such as incurring heavy debt or making large resource commitments, in the interest of obtaining high returns by seizing opportunities in the marketplace” (Lumpkin and Dess, 1996, p. 144).

Prior research revealed that the riskiness or risk taking construct is largely independent of willingness to cannibalize (Tellis et al., 2009) and proactiveness (Kreiser et al., 2010b) and yielded mixed results regarding its relationship with performance (Talke, 2007a; Venkatraman, 1989), although meta-analytic research has identified a modest positive .14 correlation between riskiness and business performance (Rauch et al., 2009). However, extending Venkatraman’s (1989) seminal work, Talke (2007a) demonstrated that a risk-averse posture toward the market and toward technology was positively associated with new product performance, arguing that riskiness may lead to overconfidence and failure when targeted markets are unknown or when outcomes of new technologies are uncertain. Even when assessing product innovativeness rather than performance as a dependent variable, a risk-averse posture toward technology was still preferable (Talke, 2007b).

Similarly, given an organizational propensity to engage in risky resource commitments and technological choices (Lumpkin and Dess, 1996; Talke, 2007b), management quality may not necessarily result in positive outcomes such as enhanced preparedness for the future. Specifically, when riskiness is high, management qualities related to excellence in information exchange, resource allocation and project coordination as well as termination (Jonas et al., 2013; Unger et al., 2012) may actually result in overly spontaneous and unreflected portfolio endeavors with uncertain outcomes such as devoting excessive human resources to risky projects or prematurely aborting other potentially important projects. Paradoxically, management excellence in these domains actually enables decision makers to quickly and efficiently implement the pursuit of overly risky endeavors in portfolio management such as allocating excessive financial funds to the pursuit of a single new technology or other highly uncertain projects. Although management quality is generally desirable and conducive to project portfolio success (Jonas et al., 2013), it may not contribute to preparedness for the future when combined with an entrepreneurial orientation high in riskiness.

Hypothesis 5. Riskiness will moderate the association between management quality and preparedness for the future such that this relationship will be stronger and more positive when riskiness is low rather than high.

3. Method

Empirical data were collected on project portfolios and organizational variables in 165 organizations within four countries (i.e., Austria, Canada, Finland and South Korea) across various industries. In order to achieve high response rates and validity, the data collection in each of the four countries was carried out by a local cooperating project management researcher, who aimed at identifying relevant organizations and collecting data in the local language. A generic approach was adopted in each country: First, questionnaires were translated into the language of the target country, e.g., for Canada questionnaires were prepared in French (Quebec area) and English. Second, the adequacy of the translated questionnaires was tested in two rounds with (a) local academics and (b) practitioners. Third, organizations managing project portfolios were approached for participation, i.e., inviting them by letter, providing them with general information on the study and offering them to register their interest. Fourth, two key informants (i.e., project portfolio decision-maker and project portfolio coordinator) involved in the management of one focal project portfolio were identified and asked to respond to the set of questionnaires.

3.1. Sample

The sample for the present field survey study is composed of 165 dyads. To ensure comparable levels of portfolio complexity, only those portfolios were accepted into the sample that consisted of at least twenty projects managed simultaneously. Two key informants, one from senior management and a project portfolio coordinator, rated each project portfolio in the sample. Senior management informants have decision authority over the firm’s project portfolio including decisions to initiate, terminate, or delay projects. These project portfolio decision-makers usually held the positions of either chief executive officer, head of business units, or head of R&D. They provided ratings of the criteria and the culture-related variables. Project portfolio coordinators in contrast are those informants who operatively manage the project portfolio on a day-to-day basis. The titles of the informants involved included portfolio manager, head of project management office, division manager, or department manager. They rated the predictor variable management quality. This multiple informant design on two different management levels was adopted to offer a broader picture of the processes, information flows and responsibilities of the analyzed firms. Furthermore, the selected research
design controls for common method bias (Podsakoff et al., 2003), because we use the coordinator informant to assess management quality and the senior management informant to assess preparedness for the future. A drawback of our design is the cross-sectional nature of our data collection which precludes definitive causal conclusions.

We received 165 completed sets of questionnaires (Australia: 56, Canada: 22, Finland: 65 and South Korea: 22). The final sample of primary data consisted of organizations from various industries: information and communication technologies (22%), manufacturing (21%), financial services (14%), health sector and pharmaceuticals (8%), services (8%), consumer goods (8%) and others (19%). Of these organizations (or business units), 40% had fewer than 500 employees, 27% had between 500 and 2000 employees, and 33% had more than 2000 employees. In return for their participation, organizations received a benchmarking report including a description of best practices employed by firms that are particularly successful in project portfolio management.

3.2. Measures

All of the variables incorporated into this study were measured with amended versions of established scales. Two key informants involved in the management of one focal project portfolio were asked to respond to the set of questionnaires. The project portfolio coordinator rated the predictor variable management quality, whereas the project portfolio decision-maker provided ratings of the criteria and the culture-related variables. Multi-item measurement scales applied in this research were based on the literature on innovation management, project portfolio management, and related fields. For all constructs, previously developed scales were adapted according to the research goals. Informants had to assess each item on a Likert-type response scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”). The measures and sample items are outlined below.

The scales measuring project portfolio success, i.e., preparedness for the future and project portfolio synergy were drawn from studies on multi-project management. Both were assessed by the senior management informant. Preparedness for the future was measured with four items that were adopted from Shenhar et al. (2001) and Shenhar and Dvir (2007). Two sample items are, ‘through our projects we often discover further market, technology, product opportunities’ and ‘our projects put us a step ahead of our competitors in terms of new products, technologies and services’. The internal consistency reliability (Cronbach’s alpha) of the future preparedness scale was .80. The scale assessing project portfolio synergy consisted of three items adapted from Jonas et al. (2013). A sample item is, ‘we consistently use technological synergies (e.g., shared usage of modules, platforms, technologies, etc.) between our projects’. Cronbach’s α of the project portfolio synergy scale was .81.

The items of the scale measuring the predictor variable management quality (alpha = .91) related to project portfolio management processes were taken from Jonas et al. (2013) and Unger et al. (2012). This variable was assessed by the project portfolio coordinator informant and consisted of 21 items pertaining to information quality, allocation quality, cooperation quality and termination quality. Sample items for each quality are, respectively: ‘we can access all relevant information on a project’s status and resources easily and quickly’, ‘we allocate human resources to projects quickly and reliably’, ‘our project teams support each other (e.g., in case of resource bottlenecks and content questions)’, and ‘overall we abort projects smoothly and without problems’.

The scales measuring the three organizational variables willingness to cannibalize, proactiveness and riskiness were drawn from innovation and entrepreneurship research. All of these variables were assessed by the senior management informant. Willingness to cannibalize (alpha = .71) was measured with three items from the scale by Tellis and associates (2009). A sample item is, ‘we tend to oppose new projects that could take away from sales of our existing products (reverse coded)’. Proactiveness (2 items; alpha = .62) and riskiness (3 items; alpha = .72) were both adopted from Venkatraman (1989) and Talke (2007a, 2007b). Sample items are, ‘compared to our competitors, we are always the first to introduce new technologies’ and ‘we accept high risks within our strategic scope’, respectively.

4. Results

Means, standard deviations and intercorrelations of the study variables are listed in Table 1. Hypotheses 1 and 2, specifying direct relationships between management quality as well as proactiveness and the two criteria preparedness for the future and portfolio synergy, were tested by assessing the standardized regression coefficients obtained from multiple hierarchical regression analyses (Pedhazur, 1997). Management quality was entered into the first block, whereas the three organizational variables willingness to cannibalize, proactiveness and riskiness were incorporated into the second block of the regression equation (see Table 2). It should be briefly noted that a consideration of the zero-order correlations among the predictor and moderator variables (see Table 1) does not suggest serious multicollinearity problems (Pedhazur, 1997). For example, riskiness was significantly but not overly strongly correlated with both willingness to cannibalize ($r = .29$, $p < .01$) and with proactiveness ($r = .46$, $p < .01$), whereas other relationships (e.g., between proactiveness and willingness to cannibalize or between management quality and riskiness as well as willingness to cannibalize) were nonsignificant.

Hypothesis 1 predicted that management quality would be positively associated with preparedness for the future and portfolio synergy. As indicated in Table 1, management quality was positively and significantly correlated with both preparedness for the future ($r = .22$, $p < .01$) and portfolio synergy ($r = .30$, $p < .01$). Similarly, multiple regression analyses (see Table 2) identified management quality as a positive and significant predictor of preparedness for the future ($\beta = .21$, $p < .05$) as well as synergy ($\beta = .27$, $p < .01$). Therefore, Hypothesis 1 received full support.

Hypothesis 2 anticipated that proactiveness would be positively associated with preparedness for the future and portfolio synergy. As can be seen in Table 1, proactiveness yielded a substantial positive and significant zero-order correlation with preparedness for the future ($r = .53$, $p < .01$) and was also
positively and significantly correlated with portfolio synergy ($r = .37$, $p < .01$). Consistent with Hypothesis 2, multiple regression analyses (see Table 2) demonstrated that proactiveness was related positively and significantly to preparedness for the future ($\beta = .45$, $p < .01$) as well as portfolio synergy ($\beta = .21$, $p < .05$), although it was more strongly associated with the former criterion, as anticipated in the introduction. Hence, Hypothesis 2 was fully supported. Although direct associations between the other two organizational predictors and the criteria were not explicitly hypothesized, it should be noted that willingness to cannibalize was unrelated to both criteria, whereas riskiness related positively and significantly to portfolio synergy ($\beta = .18$, $p < .05$) but not to preparedness for the future.

The three interaction hypotheses (3, 4 and 5) were examined with moderated hierarchical regression analyses (Aiken and West, 1991). To provide a conservative test of our moderator hypotheses, we adopted the traditional 5% significance level and entered all of the three relevant products of the z-standardized predictor management quality and the three z-standardized moderators into the final block of one and the same regression analysis, after the predictor management quality and the three moderating variables (see Table 3). If a product term was significant ($p < .05$), we created a graph illustrating the nature of the interaction effect by plotting two predictor-criterion regression lines on the basis of moderator scores one standard deviation above and below the mean (Aiken and West, 1991). The moderated hierarchical regression analysis (Table 3) yielded significant regression weights for all of the three interaction terms. Together, the three interaction terms accounted for a significant 4% increment of the predicted variance in future preparedness ($\Delta R^2 = .04$, $p < .05$) beyond that determined by the predictor and the three moderators alone.

Hypothesis 3 predicted that willingness to cannibalize would moderate the relationship between management quality and preparedness for the future such that this association would be stronger and more positive when willingness to cannibalize was high rather than low. As shown in Table 3, the product term of management quality and willingness to cannibalize was positive and statistically significant ($\beta = .16$, $p < .05$), hence indicating a positive interaction effect, i.e., a stronger positive relationship between predictor and criterion at high moderator values (Bobko, 2001). The nature of this interaction is depicted in Fig. 2. As hypothesized, management quality positively predicted preparedness for the future in companies high in willingness to cannibalize. On the contrary, management quality did not make a substantial difference in terms of future preparedness when willingness to cannibalize was low. When willingness to cannibalize was low, no positive association between management quality and future preparedness emerged. The highest level of preparedness for the future was achieved when both management quality and willingness to cannibalize were high. Overall, this pattern of findings fully supports Hypothesis 3.

Hypothesis 4 modeling proactiveness as a moderator implicated a stronger positive relationship between management quality and preparedness for the future when proactiveness was high rather than low. In concordance with this expectation, the product term of management quality and proactiveness yielded a positive and significant regression weight ($\beta = .21$, $p < .05$), thus suggesting a positive interaction effect. As hypothesized, management quality positively predicted preparedness for the future in companies high in proactiveness, but not among those low in proactiveness (see Fig. 3). The highest level of preparedness for the future was achieved when both management quality and proactiveness were high. This set of results provides full support of Hypothesis 4.

Finally, Hypothesis 5 anticipated that riskiness would moderate the relationship between management quality and preparedness for the future such that this relationship would be stronger and more positive when riskiness was low rather than high. As shown in

Table 2
Multiple hierarchical regression analyses of preparedness for the future and project portfolio synergy on the predictors.

<table>
<thead>
<tr>
<th>Hierarchical block variables</th>
<th>Prepared for the future</th>
<th>Synergy</th>
<th>$\Delta R^2$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1: Portfolio predictor</td>
<td>.04*</td>
<td>.07**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management quality</td>
<td>.21*</td>
<td>.27**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 2: Organizational predictors</td>
<td>.24**</td>
<td>.11**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willingness to cannibalize</td>
<td>.12</td>
<td>.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proactiveness</td>
<td>.45**</td>
<td>.21*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riskiness</td>
<td>.05</td>
<td>.18*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total $R^2$</td>
<td>.28**</td>
<td>.18**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: $N = 165$. * $p < .05$. ** $p < .01$.

Table 3
Moderated hierarchical regression analysis of preparedness for the future on management quality and the culture-related variables.

<table>
<thead>
<tr>
<th>Hierarchical block variables</th>
<th>Prepared for the future</th>
<th>$\Delta R^2$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1: Portfolio predictor</td>
<td>.04*</td>
<td>.21*</td>
<td></td>
</tr>
<tr>
<td>Management quality</td>
<td>.24**</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>Block 2: Organizational predictors</td>
<td>.45**</td>
<td>.16*</td>
<td></td>
</tr>
<tr>
<td>Willingness to cannibalize</td>
<td>.21*</td>
<td>.21*</td>
<td></td>
</tr>
<tr>
<td>Riskiness</td>
<td>.05</td>
<td>.18*</td>
<td></td>
</tr>
<tr>
<td>Total $R^2$</td>
<td>.32**</td>
<td>.18**</td>
<td></td>
</tr>
</tbody>
</table>

Note: $N = 165$. * $p < .05$. ** $p < .01$. 

Table 3, the product term of management quality and riskiness was negative and statistically significant ($\beta = - .21, p < .05$), hence indicating a negative interaction effect, i.e., a stronger positive relationship between predictor and criterion at low moderator values (Bobko, 2001). As expected and illustrated in Fig. 4, management quality was positively associated with preparedness for the future in companies low in riskiness. On the other hand, in organizations high in riskiness, management quality negatively related to preparedness for the future. In conclusion, this pattern of results fully supports Hypothesis 5.

In summary, the set of moderator analyses revealed that management quality positively related to preparedness for the future only when willingness to cannibalize was high (see Fig. 2), when proactiveness was high (see Fig. 3) or when riskiness was low (see Fig. 4). Therefore, Hypotheses 3, 4 and 5 received full support. In support of differential validity, none of the three interaction terms produced significant regression weights for the contrasting criterion portfolio synergy, hence demonstrating that our set of significant interaction results does not simply apply to any success criterion in project portfolio management but rather refers specifically to preparedness for the future.

5. Discussion

To date, almost no research has identified the predictors of preparedness for the future in project portfolio management (Meskendahl, 2010; Teller and Kock, 2013) or contrasted its potential antecedents with those of other outcomes such as portfolio synergy. Furthermore, very few studies have investigated main or moderating effects of entrepreneurial orientations such as proactiveness and risk taking or dimensions of corporate innovation culture including willingness to cannibalize within the realm of project portfolio management. The set of findings emanating from the present study helps reduce both of the aforementioned research gaps. As hypothesized, preparedness for the future was positively and significantly associated with two predictor variables, namely the recently developed construct of management quality with respect to portfolio execution (i.e., excellence regarding project coordination, information, allocation and termination; Jonas et al., 2013; Unger et al., 2012) and the entrepreneurial orientation of proactiveness, which implies a forward-looking and opportunity-seeking perspective typical of a market leader (Kreiser et al., 2010b; Lumpkin and Dess, 1996; Talke, 2007a; Venkatraman, 1989).

As anticipated, the positive relationship between management quality and future preparedness was significantly moderated not only by proactiveness, but also by a second entrepreneurial orientation, namely risk taking or riskiness, which captures an organization’s proclivity to venture into the unknown and to allocate substantial resources to uncertain projects including potential failures (Kreiser et al., 2010b; Lumpkin and Dess, 1996; Talke, 2007a; Venkatraman, 1989). Importantly, the two entrepreneurial orientations exhibited contrasting moderating effects: For a positive association between management quality and future preparedness to occur, proactiveness had to be high, whereas riskiness had to be low. This pattern of findings suggests that management quality may need to be complemented by high proactiveness or low riskiness to exert its potential positive influence on preparedness for the future.

Finally, as expected, the association between management quality and future preparedness was significantly moderated by willingness to cannibalize, a dimension of corporate innovation culture reflecting the degree to which members of an organization are willing to sacrifice and reduce the value of current profit-generating assets so that the organization may proceed with the implementation of new innovations (Chandy and Tellis, 1998; Danneels, 2008; Danneels and Sethi, 2011; Tellis et al., 2009). The nature of the significant moderating effect involving willingness to cannibalize suggests that management quality may positively influence future preparedness only in companies high in willingness to cannibalize. In conclusion, the highest levels of preparedness for the future in project portfolio management were identified in organizations that were not only rated high in management quality, but also high in willingness to cannibalize, high in proactiveness and low in riskiness. The unique applicability and divergent validity of these results for future preparedness as a distinctive criterion within the realm of portfolio management is corroborated by the fact that none of the three significant interaction effects was obtained for the second criterion portfolio synergy, which was included for comparison purposes. Theoretical as well as practical implications of these findings are explicated in the subsequent paragraphs, followed by a discussion.
of study strengths as well as limitations and an exposition of suggestions for future research.

5.1. Implications for theory

The present study revealed positive relationships between management quality and proactiveness, and both outcomes (future preparedness and portfolio synergy), hence underlining the importance of managerial excellence for project portfolio success (Jonas et al., 2013) and expanding the scope of criteria associated with proactiveness (Kreiser et al., 2010a; Lumpkin and Dess, 2001). For example, Kreiser et al. (2010a) showed “that proactiveness positively impacts firms’ perceptions of environmental opportunities, and these organizations then utilize innovativeness and strategic renewal in an effort to capture these opportunities” (p. 159). Complementing such findings, our study suggests that proactiveness may play a key role in contributing to organizational-level project management success not only by directly facilitating two important criteria of project portfolio success (i.e., preparedness for the future and portfolio synergy), but also by enhancing the positive relationship between management qualities related to project coordination, information, allocation and termination on the one hand and future preparedness on the other hand.

All of the three culture-related variables (willingness to cannibalize, proactiveness, riskiness) emerged as significant and differential moderators within one and the same multiple regression analysis. This convincing pattern of results in conjunction with the fact that these three variables yielded only small to moderate intercorrelations demonstrates the value of simultaneously considering culture-related dimensions from the corporate innovation culture model by Tellis and associates (2009) as well as the entrepreneurial orientation or corporate mindset frameworks by Lumpkin and Dess (1996) and Talke (2007a), respectively. Obviously, the construct domain of the corporate culture dimension of willingness to cannibalize (Chandy and Tellis, 1998; Danneels and Sethi, 2011) does not overlap overly substantially with the two entrepreneurial orientation variables proactiveness and riskiness. Recently, Kreiser and associates (2010b) identified proactiveness and risk taking as two different key dimensions of entrepreneurial orientation, demonstrating that several country-level predictors differentially related to these two factors. Our study adds to the empirical evidence regarding the differential validity of these two constructs by revealing distinctive main and moderating effects of these two entrepreneurial orientation dimensions on the criteria. While both were positively and significantly associated with synergy, only proactiveness related positively and significantly to preparedness for the future in project management.
portfolio management. Furthermore, the two entrepreneurial orientation factors yielded opposing moderating influences on the relationship between management quality and future preparedness. Recently, Covin and Lumpkin (2011) encouraged entrepreneurial orientation scholars to explicitly recognize and defend the particular conceptualization employed in their research. Because of our aim to identify the differential effects of proactiveness and riskiness, the multidimensional conceptualization clearly suited our purpose. First, proactiveness was more strongly and positively associated with future preparedness than with portfolio synergy. Second, riskiness positively and significantly related to portfolio synergy but not to future preparedness. Third, proactiveness positively and significantly moderated the link between management quality and future preparedness, whereas riskiness negatively and significantly moderated the same relationship.

In terms of the methodological taxonomy of moderating effects proposed by Podsakoff et al. (1995), both of these moderating influences were even stronger than anticipated, because our figures suggested that the moderators reversed the relationship from negative to positive or vice versa rather than simply functioning as an enhancer or neutralizer of the positive effects of management quality. Together, these three findings strongly corroborate previous suggestions (Kreiser et al., 2010b) to separately and simultaneously consider the two variables proactiveness and riskiness, hence supporting the multidimensional rather than unidimensional conceptualization of the entrepreneurial orientation construct (Covin and Lumpkin, 2011). Furthermore, our findings pertaining to proactiveness and riskiness complement the findings by Talke (2007a) who demonstrated that high levels of proactiveness but low levels of riskiness related to the market and to technology were positively associated with business performance. The distinctive sets of results for future preparedness in comparison with portfolio synergy reflect the differential validity of our set of predictions. For example, riskiness positively related to synergy but not to future preparedness, and all three moderating effects applied only to future preparedness but not to synergy. Complementing previous micro-level research on predictors of proactive versus non-proactive criteria (Parker et al., 2006; Rank et al., 2007), this pattern of findings demonstrates that organization-level proactivity criteria such as future preparedness are also associated with unique antecedents as compared to less proactive outcomes such as portfolio synergy.

5.2. Implications for practice

From a practical perspective, our findings suggest that management quality should be enhanced in organizations utilizing project portfolios, particularly if their cultures are high in willingness to cannibalize, high in proactiveness or low in riskiness. Ideally, organizations may create synergic combinations of excellent management qualities and a conducive organizational culture. With respect to the supportive test of Hypothesis 3, enhancing willingness to cannibalize in conjunction with high management quality represents one potential opportunity to create such a synergy. Previous research on the antecedents of corporate innovation culture dimensions (Chandy and Tellis, 1998) revealed that willingness to cannibalize may be enhanced by providing top management support to product champions and allowing them to influence the organization’s activities, by enhancing the firm’s future-market focus through an emphasis upon future customers and competitors and by creating active internal markets featuring high levels of autonomy within and competition across an organization’s business units. As Danneels and Sethi (2011) recently suggested, although willingness to cannibalize is “quite easy to deploy, managers often try to protect their current investments in resources and try to exploit them to the maximum extent possible; thus they are reluctant to cannibalize the existing resources for some seemingly uncertain future gains” (p. 1036). When preparedness for the future in project portfolio management is a desired aim, managers may need to overcome this reluctance and permit cannibalization of existing resources, because project portfolio management quality in itself may not sufficiently serve this aim unless it is complemented by willingness to cannibalize, as suggested by our set of findings.

Whereas several studies have identified the antecedents of willingness to cannibalize (e.g., Chandy and Tellis, 1998; Danneels and Sethi, 2011; Nijssen et al., 2005), thus suggesting practical measures to enhance this dimension of corporate innovation culture, only a few studies have investigated determinants of proactiveness or riskiness. Furthermore, recent research (Kreiser et al., 2010b) indicates that these entrepreneurial orientations are partially determined by national-level factors such as GDP scores, political risk levels and societal cultural values which cannot be altered by organization leaders. For example, firms in individualistic countries tended to be lower in proactiveness, presumably because anticipating and shaping future changes in markets and technologies requires concerted collective efforts (Kreiser et al., 2010b). Therefore, top managers and portfolio coordinators who wish to achieve future preparedness in project portfolio management within individualistic societies may need to exhibit particularly exceptional efforts to cultivate proactive orientations in order to counteract individualistic propensities in their countries. Recent qualitative research (Zellweger and Sieger, 2012) demonstrated a certain malleability of proactiveness, suggesting that company-level proactiveness may fluctuate over time, such that longer periods of low proactiveness are occasionally interspersed with deliberately selected proactive moves. Once excellence in multiproject management is achieved, such proactive moves may be instrumental in engendering benefits from management quality in terms of enhanced future preparedness. In general, enhancing proactiveness appears to be particularly worthwhile, because it positively predicts both exploration and exploitation (Kollmann and Stöckmann, 2010), thus facilitating ambidexterity, which in turn positively affects financial performance (Uotila et al., 2009). Overall, our results suggest that one path to a successful preparation for the future for companies to follow may be to enhance management quality in project portfolio management, while simultaneously fostering suitable facets of organizational culture such as willingness to cannibalize and proactiveness.
3.3. Strengths, limitations and future research directions

The strengths of our study include its theoretical grounding in extant models of entrepreneurial orientation and organizational culture combined with the novelty of the specific research hypotheses, the inclusion of two different rating sources to reduce same-source bias (Podsakoff et al., 2003) and the external validity of our results emanating from the inclusion of firms from four culturally different countries and several industries. Because recent research (Kreiser et al., 2010b) demonstrated that organizational variables such as proactiveness and risk taking are partially determined by national-level factors such as cultural values and GDP, it is advantageous to include companies from multiple countries in studies incorporating organizational culture dimensions or entrepreneurial orientations (Tellis et al., 2009). If we had included only organizations from one country (or, for that matter, a few similar countries), there would have likely been a range restriction regarding proactiveness, risk taking and willingness to cannibalize, and the generalizability of our findings would have been questionable. Finally, the fact that all of the three interaction terms yielded significant regression weights in predicting future preparedness when entered simultaneously into one and the same multiple hierarchical regression analysis (Pedhazur, 1997) demonstrates the strong set of findings obtained in the present study.

Limitations include the cross-sectional design, which precludes definitive causal conclusions, and the modest internal consistency reliability of the proactiveness scale. However, it should be noted that several studies published in leading management journals (e.g., Danneels, 2008; Kreiser et al., 2010b) also utilized abbreviated scales featuring only two or three items to measure proactiveness, riskiness or willingness to cannibalize and detected similarly modest or even lower reliability coefficients. For example, willingness to cannibalize, which featured an acceptable .71 internal consistency in the present study, yielded an alpha of .58 in the large-scale international study by Tellis and associates (2009), who generally adopted a low Cronbach’s alpha cutoff of .60 for their six corporate culture scales and still fully utilized the responses pertaining to willingness to cannibalize in their analyses. In terms of effect sizes, the main effects in the present study accounted for 28% of the variance in future preparedness, whereas the interaction effects explained only 4%. However, considering the statistical difficulties of detecting significant interactions in field studies and the fact that most methodological experts consider even a 1%–2% increase in explained variance as meaningful (Champoux and Peters, 1987; McClelland and Judd, 1993; Villa et al., 2003), the effect size associated with our significant interaction terms may be considered fairly substantial.

With respect to willingness to cannibalize, we did not distinguish between different subdimensions of the construct, whereas Nijsen et al. (2005) developed and tested a three-dimensional model of willingness to cannibalize on capabilities, sales and investments, identifying different antecedents and consequences of these three factors. For example, product champion influence was positively related to willingness to cannibalize on capabilities but unrelated to the other two factors, whereas future market orientation was unrelated to willingness to cannibalize on capabilities and positively related to the other two factors. Therefore, one theoretically and practically meaningful suggestion for a fine-grained future study may be to assess whether our moderating effect is caused primarily by one of these three subdimensions of willingness to cannibalize and whether more targeted practical interventions may be suggested to increase this specific subdimension.

As noted in the previous discussion of practical implications, fewer studies have examined the antecedents of proactiveness or riskiness as compared to willingness to cannibalize. Therefore, future research is needed to identify specific firm-level and department-level predictors that influence proactiveness as well as riskiness in companies utilizing project portfolio management. Because of the lack of studies on predictors of company-level proactiveness and the limited applicability of the numerous findings regarding determinants of individual-level proactivity (e.g., Parker et al., 2006; Rank et al., 2007) at the portfolio level, previous findings on the antecedents of group-level proactivity may serve as a starting point. For example, Williams et al. (2010) found team-level proactiveness to be positively predicted by the team leader’s transformational leadership (comprising visionary, inspiring and stimulating supervisory behavior), the proportion of proactive personalities among the team members and the degree of self-management within the team. Similar constellations of leadership, personality and work design characteristics may also determine the level of proactiveness within project portfolio management.

Furthermore, future research may consider additional portfolio-level success criteria such as strategic fit or portfolio balance (Killen et al., 2008; Unger et al., 2012) and incorporate additional culture-related constructs including analysis (Talke, 2007a), competitive aggressiveness (Lumpkin and Dess, 2001) and corporate practices such as providing managerial support and incentives for product champions (Tellis and Dess, 2001). Such variables may not only function as predictors or moderators but also as mediators revealing the underlying organizational-level mechanisms linking managerial actions to success criteria. For example, Ussahawanitchakit (2011) recently identified proactiveness as a mediator of the relationship between the inspirational motivation dimension of the transformational leadership exhibited by executives and firm performance. By communicating a compelling vision for the future of their company and by instilling optimism in firm members (Howell and Avolio, 1993; Keller, 1992; Rank et al., 2009), transformational leaders may successfully enhance proactiveness, which may in turn facilitate future preparedness in project portfolio management. Moreover, a recent study demonstrated that entrepreneurial orientation (including proactiveness and risk taking) needs to be combined with transformational leadership behaviors (e.g., vision articulation) to positively affect firm performance (Engelen et al., 2015). Therefore, future research may also examine whether such interactions between entrepreneurial orientation and leadership constructs also apply to future preparedness as an outcome variable.

Finally, in their recent integrative theoretical piece on entrepreneurial orientation research, Covin and Lumpkin (2011)
proposed a new high-potential research focus, which has been partially addressed in the present research and may be further pursued in subsequent studies. These scholars noted that most entrepreneurial orientation research has employed a unidimensional approach and suggested that a configurational approach may be pursued to assess how particular patterns of entrepreneurial orientations relate to outcomes such as strategic renewal, particularly when the multidimensional conceptualization is used. Therefore, future research may not only assess how multiple separate dimensions such as proactiveness and riskiness relate to criteria such as future preparedness when considered simultaneously, but also incorporate additional dimensions and assess moderating effects (e.g., three-way interaction effects) among them. In conclusion, although the present study has not fully pursued all potential avenues for research on the intersection of project management, organizational culture and entrepreneurial orientation, we hope that our theoretical and empirical contribution has enhanced preparedness for the future in project portfolio management research.

Conflict of interest statement

The authors declare that there are no conflicts of interest regarding this paper.

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