Boosting the confidence of new product development teams: The role of team boundary spanning, team size and functional diversity[1]

Abstract

In today's highly interconnected, uncertain, and dynamic business environment, team boundary spanning has become an important determinant of the performance of new product development (NPD) projects. Despite the positive evidence supporting the use of boundary spanning activities by NPD teams, little is still known about how boundary spanning teams become high-performance teams. The current study advances research on this subject by examining the mediating effect of team potency on the relationship between team boundary spanning and new product performance, as well as the moderating effects of team size and functional diversity on the relationship between team boundary spanning and team potency. Data from a time-lagged survey study of 140 NPD projects found that team boundary spanning can promote team potency which, in turn, results in greater product quality and new product creativity. The positive effect of team boundary spanning on team potency was found to be more pronounced for NPD teams of medium size and high levels of functional diversity.

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1. Introduction

In today's highly networked and volatile business world, team boundary spanning has emerged as a critical activity for new product development (NPD) teams and their performance (Carboni et al., 2021; Zhang and Li, 2021). Thus, research in NPD has shown that team boundary spanning positively influences several new product outcomes including adherence to budgets and schedules, technical quality and new product competitive advantage (Ancona and Caldwell, 1992a; Carbonell and Rodriguez-Escudero, 2019; Howell and Shea, 2006). Team boundary spanning refers to a team's actions to establish links and manage interactions with individuals and groups inside and outside the organization with the purpose of achieving team's goals and objectives (Ancona et al., 2009; Joshi et al., 2009). Despite the relevance of team boundary spanning in NPD, there is great deal we still do not know about these activities. For example, little is still known about how team boundary spanning impacts new product performance (Marrone, 2010; Edmondson and Harvey, 2018). The current study advances research on this subject by examining the mediating effect of team potency on the relationship between team boundary spanning and new product performance.

Team potency, defined as a group's belief in its ability to perform successfully (Guzzo et al., 1993), has been described as "one of the most important ingredients of team motivation and team effectiveness" (Hu and Liden, 2011; p. 851). With a strong sense of confidence, teams set more challenging goals, persevere in the face of unexpected challenges and adversity, and are ultimately more likely to succeed (Gully et al., 2002; Larson and LaFasto, 1989; Lee et al., 2002). The notion of team potency carries high significance for NPD teams. The development of new products is a highly uncertain and ambiguous process during which NPD teams encounter numerous obstacles

and unexpected difficulties (Edmondson and Nembhard, 2009). In this context, having a strong conviction in the team's ability to succeed can become an important asset, as such conviction can help a NPD team adapt to and meet the challenges it will likely face during the NPD process. In this study, we expect team boundary spanning activities to foster a NPD team's sense of potency. Team boundary spanning activities can provide NPD teams with access to highly relevant and valuable resources (Ancona and Caldwell, 1992a; Ancona et al., 2009; Marrone, 2010) which, according to team potency's research, will positively influence team members' assessment of their own ability to successfully complete the NPD project, thus contributing to the development of a sense of potency in the group (Guzzo et al., 1993). Higher levels of team potency are, in turn, expected to result in greater new product quality and new product creativity. Both new product quality (Molina-Castillo and Munuera-Aleman, 2011; McNally et al., 2011) and new product creativity (Cho and Hahn, 2004; Kim and Slater, 2013) are strong predictors of new product performance.

Prior research has speculated that team's design features may impact a team's ability to carry out boundary spanning activities effectively (Marrone, 2010). Accordingly, a second objective of the current study is to investigate how team size and functional diversity impact the relationship between team boundary spanning and team potency. In particular, we contend that because of fewer external connections and lower manpower, functionally homogenous teams and smaller teams, respectively, may find boundary spanning activities too onerous and difficult to execute (Marrone et al., 2007). At the same time, larger teams and teams with high levels of functional diversity, which often suffer from poor internal communication and coordination (Cannon-Bowers and Bowers, 2011; Keller, 2001), may also experience challenges in leveraging the fruits of their boundary spanning work.

The current study makes four significant contributions to the literature. Firstly, while prior studies have examined the impact of team internal processes, team design variables, and organizational context variables on team potency (de Jong et al., 2005; Tröster et al., 2014; Hu and Liden, 2011), team external processes such as team boundary spanning activity has been left unexplored. As NPD teams increasingly rely on their ability to span functions and organizational boundaries to perform their work (Marrone, 2010), understanding how boundary spanning influences team potency is an important matter to academics and practitioners alike. Secondly, despite its relevance to NPD performance, empirical research of the impact of team potency on NPD performance is very sparse and limited to only two empirical studies namely, Howell and Shea (2006) and Akgün et al., (2007) which report positive effects of team potency on team performance, NPD speed, NPD cost, and market success. By examining, for the first time, the influence of team potency on new product creativity and new product quality, the current study furthers our understanding of the benefits of team potency for NPD teams. Thirdly, while prior research has examined the mediating effects of role overload (Marrone et al., 2007) and psychological safety (Faraj and Yan, 2009) on the relationship between team boundary spanning and team performance, no research to date has addressed the mediating role of team potency. Thus, by investigating the role of team potency in explaining the impact of team boundary spanning on NPD performance, the current study extents research on the mechanisms by which team boundary spanning influences team performance. Finally, by incorporating the moderating effects of team size and functional diversity on the relationship between team boundary spanning and team potency, the study provides important new insights into the conditions under which team boundary spanning is likely to deliver the best results to NPD teams.

The rest of the article is organized as follows. The first section defines team boundary spanning,

team potency and introduces the theoretical model. Next, the study's hypotheses are developed. After that, the data collection process is presented, followed by the description of the study's measures, data analysis technique and results. The study closes with the discussion of the results, theoretical and managerial implications, study's limitations and future research lines.

2. Definitions and theoretical framework

2.1. Team boundary spanning activity and team potency

Team boundary spanning is defined as a team's actions to establish linkages and interact with relevant actors inside and outside the organization for the purpose of meeting team's goals and objectives (Marrone, 2010). Team boundary spanning encompasses a broad range of external activities. Ancona and Caldwell (1992a) identified three broad categories of boundary spanning activities: ambassador, task coordination and scouting. Activities such as developing relationships with external groups, keeping them informed of the team's progress and talking up the NPD project represent ambassador activities. Task coordination activities include discussing technical and marketing problems with others, getting feedback on product concepts, prototypes and team's ideas and monitoring cross-team progress and workflow (Ancona and Caldwell, 1992a). Scouting activities reflect team interactions with external parties to gain access to various types of information including competition, market and technological information as well as political data about support or opposition to the group activities. Collectively, ambassador, scouting and task coordination activities define team boundary spanning activity (Ancona and Caldwell, 1992a; Marrone, 2010).

Team potency refers to a group's shared belief that it can be effective (Guzzo et al., 1993). The construct of potency is parallel to that of team efficacy because both are motivational constructs that reflect appraisals of capabilities (de Jong et al., 2005). Yet, they differ in one important aspect.

Thus, whereas team efficacy refers to a team's belief that it will succeed in relation to a specific task (de Jong et al., 2005; Hu and Liden, 2011; Shelton et al., 2010; Stajkovic et al., 2009), team potency refers to a more generalized belief. It concerns beliefs about overall effectiveness across multiple tasks encountered by groups in complex environments (Guzzo et al., 1993). Given that NPD is a complex process involving multiple interdependent activities (e.g., concept design, product development, manufacturing, testing, etc.), we believe that team potency is a construct well-suited to be investigated in the context of NPD teams.

2.2. Theoretical framework

Figure 1 depicts the study's theoretical model. As shown, team boundary spanning is expected to positively influence team potency. Research in NPD suggests that boundary spanning activities can provide NPD teams with access to highly relevant and valuable resources, such as information, project- and problem-specific expertise, feedback on progress and support from key external parties (Ancona and Caldwell, 1992a; Ancona et al., 2009; Marrone, 2010). According to Guzzo et al.'s (1993) seminal work on team potency, having access to highly relevant and valued resources will positively influence team members' appraisal of their ability to successfully complete the NPD project and contribute to the development of a sense of potency within the team. Team potency, in turn, is theorized to have a positive impact on new product quality and new product creativity. Both of these effects are based on extensive research in team potency suggesting that a group's sense of potency can have a profound effect on the actions that teams take, their level of effort and their perseverance in the face of insurmountable obstacles (de Jong et al., 2006; Gully, et al., 2002; Guzzo et al., 1993; Mathieu et al., 2008). New product creativity is defined as the degree to which a new product is novel and has the potential to change thinking and practice (Moorman and Miner, 1997). New product quality refers to how well the new product meets the

demands of target customers (Koufteros et al., 2005; Sheremata, 2000). Finally, our theoretical model depicts functional diversity and team size as moderators of the relationship between team boundary spanning and team potency. These relationships are in keeping with research on team boundary spanning which suggests that the impact of team boundary spanning on team outcomes may be contingent on team's design characteristics (Marrone, 2010). Team size concerns the number of members in the team and functional diversity alludes to the number of functional departments represented on the team (Sethi et al., 2001).

(Insert Figure 1 here)

3. Hypotheses development

3.1. Impact of team boundary spanning on team potency

Team boundary spanning is expected to strengthen a NPD team's sense of confidence in their capacity to be effective across the multiple tasks that characterize the development of new products. For example, task coordination activities can enable NPD teams to coordinate and synchronize NPD activities with external parties, thus improving a team's ability to meet deadlines and keep work flowing (Ancona et al., 2009). Also, through task coordination activities, NPD teams can resolve technical and marketing problems arising during the NPD process by recruiting the assistance of other groups inside and outside the organization and seeking feedback on their work, all of which may well influence a group's sense of potency. Ambassadorial activities can also boost a team's sense of confidence by allowing NPD teams to build needed support for the NPD project and team decisions (Ancona and Caldwell, 1992a; Howell and Shea, 2006; Joshi et al., 2009). Finally, scouting activities can enrich team members' expertise and knowledge by keeping the team abreast of the latest technical, organizational and market developments (Ancona et al., 2009; Howell and Shea, 2006). Also, these activities can enable a better understanding of

the needs and demands of the project's key internal and external stakeholders (Benoliel and Somech, 2015) and provide the opportunity to learn from the experiences of others (Bresman, 2010) which, according to team potency's research, can elevate a team's belief in their capacity to be effective (Guzzo et al., 1993). Drawing on the previous discussion, we propose that:

H1: Team boundary spanning is positively related to team's potency

3.2. Impact of team potency on new product quality and new product creativity

The current study proposes a positive effect of team potency on new product quality. Research on team potency has noted that a characteristic of high-potency teams is their strong conviction that they can deliver high quality work (Guzzo et al., 1993). It is because of such conviction that NPD teams with high potency are expected to set high goals for new product quality and to commit to those goals (Lee et al., 2002; Lester et al., 2002). Also, when NPD teams have strong beliefs about their capability to deliver a high-quality product, they can be expected to invest more time, energy and effort at identifying and solving any technical problems that might arise during the development of the new product (Akgün et al., 2007). Based on these arguments, we propose that:

H2: Team potency is positively related to new product quality.

Team potency is expected to enhance new product creativity for two main reasons. First, because of their strong beliefs in their capabilities, teams with high levels of potency are more willing to engage in creative activities and experiment with new methods, approaches and behaviors (Tierney and Farmer, 2002). Secondly, teams with a strong sense of potency are said to show high resilience in the face of adversity (Lester et al., 2002; Tierney and Farmer, 2002), a quality that research on creativity regards as important in achieving creative outcomes. In this vein, Kwon et al. (2015) noted that "creative effort is usually a demanding activity that requires time and hard work; because it has a high risk of failure, it is paramount to remain persistent" (p. 678).

At the individual level, Kwon et al. (2015) has shown a positive relationship between designers' creative self-efficacy and new product creativity. Other studies have shown a positive effect between individual self-efficacy and innovative behaviour (e.g., generating and promoting new ideas, seeking out new working methods and techniques) (Nisula and Kianto, 2016). Drawing on the previous arguments and evidence, we expect NPD teams with high potency to produce products with higher levels of creativity. Thus, we propose that:

H3: Team potency is positively related to new product creativity.

3.3. Mediating effect of team potency

As noted earlier (H1), team boundary spanning activities can assist NPD teams in acquiring needed resources, support and guidance from external parties, positively influencing the development of a sense of potency in the group. In this study, we contend that the feeling of potency accrued from the team's boundary spanning efforts will lead to higher new product creativity and new product quality. This is based on extensive research in team potency suggesting that a group's sense of potency can have a profound effect on the actions that the team takes, its level of effort and its perseverance in the face of obstacles (de Jong et al., 2006; Gully, et al., 2002; Guzzo et al., 1993; Mathieu et al., 2008). Because of the feeling of potency accrued from the team's boundary spanning efforts, boundary spanning NPD teams are expected to set higher goals for new product quality and expend more time, energy and effort to ensure that they produce a high-quality product. Also, these teams will be more likely to engage in creative activities and be less deterred by the obstacles that come along the creative process (Tierney and Farmer, 2011), making it more likely for them to produce new products with high levels of creativity. Thus, we propose that:

H4a-b: Team potency mediates the effect of team boundary spanning on (a) new product creativity and (b) new product quality

3.4. Moderating effects of team size and functional diversity

Team size is expected to have a curvilinear (inverted U-shaped) moderating effect on the relationship between team boundary spanning and team potency. Previous studies suggest that team boundary spanning requires considerable effort and time from team members due to the fact that those engaged in boundary spanning are responsible for actively managing a variety of internal (e.g., building trust among team members, defining goals, etc.) and external activities (i.e., ambassador, task coordination and scouting) either simultaneously or sequentially (Marrone et al., 2007). It seems then reasonable to hypothesize that smaller teams carrying out team boundary spanning activities will likely experience work overload due to the lesser number of individuals in the team among whom to distribute the work. As a result, we expect smaller NPD teams to show lower levers of team potency.

At the same time, larger teams, although more capable to manage the overload associated with team boundary spanning, may also experience challenges in leveraging the fruits of this activity. Thus, previous studies have noted that as groups grow in size, they often experience increasing problems in communication and coordination (Cannon-Bowers and Bowers, 2011, Cohen et al., 1996; De Cremer and Leonardelli, 2003) which, we argue, can lead to losses in relation to the resources and information obtained through the team's boundary spanning wok. That is, due to poor communication and coordination within large teams, some of the information and resources obtained through boundary spanning can be overlooked or disregarded and not put to use in the NPD project which, in turn, could tone down the group's perception of boundary spanning activity as a facilitator of the group's success.

Drawing on the previous arguments, we expect team boundary spanning activity to have a greater positive effect on team potency for medium-sized teams than for smaller and larger teams.

Unlike smaller teams, medium-sized teams would have enough manpower to handle the additional workload associated with boundary spanning. Moreover, their in-between size (i.e., not too small or not too large) spares medium-size teams from experiencing the coordination and communication problems that often affect larger teams. Thus, we propose that:

H5. Team size has a curvilinear (inverted U-shaped) moderating effect on the relationship between team boundary spanning and team potency so that the positive effect of team boundary spanning on team potency will be stronger for medium-size teams than for smaller or larger teams.

Regarding functional diversity, we predict that too little and too much functional diversity can decrease the positive effect of team boundary spanning on team potency. Thus, prior research suggests that functionally diverse teams have access to larger and more diverse networks of contacts than less functionally diverse teams (Ancona and Caldwell, 1992b; Keller, 2001; Scott, 1997). Given that team boundary spanning requires members to reach out and interact with people external to the team (Marrone, 2010), we argue that, in the context of team boundary spanning, the smaller and less diverse networks of low functionally diverse teams will make it more difficult for boundary-spanning teams to reach out and seek interactions with external actors (Hoegl et al., 2003). Thus, we expect boundary spanning teams to show lower levels of team potency when functional diversity is low than when it is high. However, past some optimal point, too much functional diversity may become detrimental to team boundary spanning. This prediction is in keeping with prior research in NPD suggesting that due to differing functional goals and orientations, NPD teams with very high levels of functional diversity are likely to suffer from poor communication (Keller, 2001), low team cohesion (Tekleab et al., 2016) and increased job stress (Keller, 2001) which, we argue, could reduce the efficiency with which boundary spanning teams do their work. In light of the previous discussion, we expect the positive effect of team boundary

spanning on team potency to be greater in NPD teams with moderate levels of functional diversity than in NPD teams with low and high levels. Thus, we propose:

H6. Team functional diversity has a curvilinear (inverted U-shaped) moderating effect on the relationship between team boundary spanning and team potency so that the positive effect of team boundary spanning on team potency will be stronger for medium levels of functional diversity.

4. Methodology

4.1. Sample and data collection

The unit of analysis was a recently launched NPD project in which the NPD team in charge had partaken in boundary spanning activities. The sampling frame for the study were Spanish manufacturing firms in high- and medium-technology sectors listed in the Amadeus database. The food and beverages manufacturing sector, although classified as low-technology, was also included in the sampling frame because of its high values of R&D spending (INE, 2021). We randomly selected 25 percent of the firms in each of the industry groups, which resulted in 946 manufacturing firms.

To reduce the presence of common method bias, we collected the data in two stages (Podsakoff et al., 2003). During the first stage of the data collection, a questionnaire focused on team boundary spanning activities was sent to each of the companies in our database. The questionnaire was addressed to the person in the company responsible for NPD activities who was instructed to answer the survey questions in relation to a new product that their company had developed in the last three years and had been, at least, 6 months in the market, whose development he/she had led and participated in and in which the NPD team in charge had partaken in team boundary spanning activities. A total of 146 companies returned the completed questionnaires. Data on the remaining variables in the model (i.e., team potency, new product quality, new product creativity, moderator

variables and control variables) were collected using a second survey sent by post and email to the same individuals from the 146 companies that had returned the first survey. It is important to note that all respondents were reminded of the new product chosen to answer the first survey and asked to answer the survey having the same NPD project in mind. 140 of the 146 firms contacted, completed the second survey. Thus, the study's sample consists of 140 NPD projects, each one from a different company. The time lag between the first and second surveys ranged between one to four months. The response rate for this study is 14.8%. While this response rate is not as high as one might wish, it is still comparable to that of recent studies in innovation (e.g., Pollok et al., 2019; Sigurdsson and Candi, 2020) and provides sufficient statistical power for the testing of the study's hypotheses. Power calculations were based on a medium effect size and Type I error values (α) of 0.05. In all instances, power values exceed Cohen's (2013) recommended criterion of 0.80. In particular, the minimum power value was 0.89. Of the key informants responding to the survey, 45.2% were R&D managers, 34.1% were technical managers, 13.3% were general managers and 7.4% were managers of other departments.

Table 1 shows the population and the sample for each industry group. To check for response bias by industry, we applied a two-proportion test to compare the proportions of firms in the sample and the population for each industry group. The results reveal significant differences for the industry group 'computer, electronic and electrical manufacturing'. Specifically, firms within this group are over-represented in the sample, which is reasonable to expect given that the sectors these firms belong to are high-technology industries. Additionally, for the two rounds of surveys, non-response bias was tested by comparing the responses of early (first third) and late (last third) respondents. No statistically significant differences were found in the mean scores of the constructs used in this study.

(Insert Table 1 here)

4.2. Measurement scales, reliability and validity

To assess team boundary spanning, we follow Carbonell and Rodriguez-Escudero's (2019) approach which operationalizes team boundary spanning as a second-order formative construct consisting of seven first-order reflective dimensions. These dimensions capture the three main activities of team boundary spanning (i.e., ambassador, task coordination and scouting), each of them taking place inside (i.e., intrafirm) as well as outside (i.e., extrafirm) the organization.

The characterization of team boundary spanning as a second-order formative construct is in keeping with Jarvis et al.'s (2003) guidelines for the modelling of formative measures. Thus, each of the first-order dimensions of team boundary spanning (i.e., ambassador, task coordination and scouting) represents distinctive aspects of the team boundary spanning construct (Ancona and Caldwell, 1992a) thus, dropping one of these components is likely to change the conceptual domain of the second-order construct. Also, the first-order dimensions of team boundary spanning do not necessarily co-vary with each other. For example, high level of ambassador activities do not always signify high levels of task coordination or scouting activities (Ancona and Caldwell, 1992a). Finally, the team boundary spanning's first-order constructs do not have the same antecedents and consequences. Thus, Brion et al.'s (2012) study showed that while strength of ties enhanced ambassador and scouting activities, it did not have a significant effect on coordination activities.

Table 2 lists the measurement items used for the seven dimensions of team boundary spanning along with factor loadings, average variance extracted (AVE) and composite reliability (CR) values. As shown, all of the items had factor loadings above 0.70 except for three items which had factor loadings between 0.64 and 0.68. With regard to items with factor loadings between 0.50 and

0.70, Hair et al. (2013) recommend calculating the values of the AVE and CR to examine the convergent validity of the constructs. If the AVE and CR values are respectively above their threshold values, it is then acceptable to retain the items in question. As shown in table 2, the AVE and CR values of all the team boundary spanning dimensions were respectively above the standards of 0.50 and 0.70, indicating good convergent validity. Hence, all 27 items were retained. Moreover, values of the Cronbach alphas also exceeded the standard of 0.70, providing evidence for the internal consistency of the items in each of the team boundary spanning dimensions.

(Insert Table 2 here)

To statistically validate the formative character of the team boundary spanning scale, we checked for multicollinearity among its dimensions using the variance-inflation factor (VIF). The VIF values of the dimensions were below the cut-off value of 5 (max. VIF: 2.198). Thus, there are no concerns about collinearity issues. Next, we examined the significance of the contribution of each dimension to the main construct. Fit of the formative measurement model was good as evidenced by the fact that the outer weights of all dimensions were significant at $p<0.01$ (see Table 3).

(Insert Table 3 here)

Team potency was operationalized with six items taken from Guzzo et al.'s (1993) team potency scale. While team potency is a group-based construct, the current study measures team potency using data from team leaders. To validate the adequacy of this measure, additional data on team potency from members of the participating NPD teams were collected. Out of the 140 NPD teams in the study, we received responses from 31 teams. On average, 1.8 additional members per team responded. The intraclass correlation coefficient (ICC), a widely used index to measure inter-rater agreement (McGraw and Wong, 1996; Bliese, 2000), was used to check the

interrater agreement for team potency based on both team leader and team members data available. ICC estimates and their 95% confidence intervals were calculated using SPSS statistical package version 24 based on a mean-rating, absolute-agreement and 2-way mixed-effects model. The results showed an ICC value of 0.75 (95% CI: 0.49-0.89; $F=4.24$ $p<0.001$) for the teams with available data from at least one team member, an ICC value of 0.67 (95% CI: 0.24-0.89; $F=3.39$ $p<0.01$) for the teams with available data from at least two members and an ICC value of 0.80 (95% CI: 0.35-0.97; $F=5.34$ $p<0.01$) for the teams with available data from at least three team members. These ICC values near or exceed the accepted cutoff point of 0.7 (LeBreton and Senter, 2008; Shrout and Fleiss, 1979), suggesting good agreement between team leaders and team members for the measure of team potency. This offers support for using the team leaders as reliable key informant for team potency. Thus, all further analyses are conducted on the team leader responses for team potency.

New product creativity was measured with a 5-item scale from Rindfleisch and Moorman (2001) and new product quality was measured using a 3-item scale from Sarin and Mahajan (2001). Team size refers to the number of full-time members in the team (Sethi et al., 2001). Functional diversity was operationalized as the number of functional areas represented on the team whose members were fully involved in the project rather than being ad hoc specialists or consultants who were engaged only for a limited time (Sethi et al., 2001).

The study includes several control variables that are likely to influence team potency, new product creativity and new product quality including firm size, innovation orientation, knowledge specialization and team coordination. Firm size can be considered as a proxy variable of market power and financial resources; larger organizations typically have enough R&D, marketing and financial resources to successfully develop and commercialize new products and services (Ali et

al., 1995). Thus, we expect firm size to positively influence new product quality and new product creativity. Firm size is measured in terms number of employees in the company. Innovation orientation refers to the importance a company assigns to the value of new products for creating and retaining a competitive position (Zahra, 1993). According to Siguaw et al. (2006), firms that embrace an innovation orientation provide the resources, tools, and human resource talent needed to fully develop and sustain innovation within the organization. Accordingly, we expect innovation orientation to positively influence new product creativity, new product quality and team potency. Innovation orientation was measured with three items adapted from Zahra (1993). Knowledge specialization refers to team members' distinct knowledge related to the task (Lewis 2003). Team knowledge specialization is expected to positively contribute to team potency (Guzzo et al., 1993; Gibson and Earley, 2007) and has also been related to greater new product creativity (Hirunyawipada and Paswan, 2013) and new product quality (Martin Cruz et al., 2007). Knowledge specialization was measured by 4 items adapted from Lewis (2003). Team coordination alludes to a team's ability to coordinate knowledge (Lewis, 2003). Research on team potency has shown a positive effect of cooperative team processes on team potency (Lester et al., 2002; Gibson and Early, 2007). Team coordination was measured using two items developed by Lewis (2003). The study also controls for the effects of the two moderating variables (i.e., team size and functional diversity) on team potency, new product creativity and new product quality. These effects are based on prior research that suggests a significant effect of these variables on team potency (Guzzo et al., 1993; de Jong et al., 2005; Lee et al., 2002), new product quality (Sethi, 2000) and new product creativity (Dayan and Colak, 2008). Lastly, we expect team boundary spanning to have a positive and direct effect on new product quality and new product creativity. Connecting with people outside the team can provide access to a greater number of novel ideas,

different perspectives and more diverse information, which can spark the development of new ideas (Björk, 2012; Hemphälä and Magnusson, 2012; Somech and Khalaili, 2014) and leads to greater levels of new product creativity. Furthermore, team boundary spanning can provide NPD teams with access to useful input and feedback to improve new product quality (Menon et al., 1997).

Table 4 lists the measurement items used for the remaining constructs of the study along with factor loadings, AVE and CR values. As shown, while a few scale items had factor loadings between 0.40 and 0.70, the AVE and CR's values of all the constructs exceeded the standard of 0.50 and 0.70 respectively, indicating good validity and reliability. Therefore, to preserve content validity, all items were retained (Hair et al., 2013)

(Insert Table 4 here)

Discriminant validity was tested by examining the square root of the average variance extracted for each dimension. Discriminant validity is evidenced when the square root of the AVE for each construct exceeds the corresponding correlations between that construct and any other constructs (Fornell and Larcker, 1981). All possible pairs of constructs passed this test. The heterotrait-monotrait (HTMT) ratio of correlations' approach proposed by Henseler et al. (2015) also indicated discriminant validity, as all HTMT ratios were clearly below the conservative threshold of 0.85. Table 5 shows the square roots of AVE on the diagonal, the correlation values below the diagonal and the HTMT ratios above the diagonal.

(Insert Table 5 here)

5. Data analysis and results

The proposed model was tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) algorithm (Smart PLS 3.1.5). PLS-SEM is preferable to covariance-based SEM (CB-

SEM) because their ability to handle reflective and formative measures in a single model (Hair et al., 2013). A bootstrap test (1,000 sub-samples) was used to generate the standard error and t-values of the parameters. Option "no sign change" was employed for model estimation because it results in the most conservative outcome (Hair et al., 2013).

Variables were introduced into the model hierarchically as blocks. First, we included the direct effects of team boundary spanning on team potency, team potency on new product quality and new product creativity and the effects of the control variables (Model 1). Then, we added the linear interaction between team size and team boundary spanning (Model 2) followed by the quadratic interaction (Model 3). Finally, we included the linear interaction effect between functional diversity and team boundary spanning (Model 4) and the quadratic effect (Model 5). We chose to incorporate the interaction terms of team size and functional diversity into separated models as previous research suggest that the simultaneous inclusion of multiple interaction terms in one model can mask the results, making it difficult to observe true moderating effects due to multicollinearity (Aiken and West, 1991; Neter et al., 1996). Table 6 contains the results for Models 1-5. The results indicate that the independent variables explain a significant amount of the variance of team potency (46%), new product quality (28%) and new product creativity (23%).

Results for Model 1 show a significant and positive effect of team boundary spanning on team potency (β=0.14, $p<.05$), providing support for H1. In keeping with hypotheses H2 and H3, we found positive and significant relationships between team potency and new product quality (β=0.30, $p<.01$) and between team potency and NP creativity (β=0.24, $p<.01$). A bootstrapping procedure was applied to test for the mediating effect of team potency on the relationships between team boundary spanning and new product quality and team boundary spanning and new product creativity. Results from this procedure (1,000 sub-samples) revealed that the indirect effect of team

boundary spanning on new product quality via team potency was positive and significant (β=0.04, p<0.05). Team potency was also found to mediate the relationship between team boundary spanning and new product creativity (β=0.034, p=0.05). Together these results provide support for hypotheses H4a and H4b.

The study's results provide support for hypothesis H5. Thus, we found a significant and curvilinear moderating effect of team size on the relationship between team boundary spanning and team potency (β=-0.32, p<.05). Contrary to expectations, we did not find a significant curvilinear moderating effect of functional diversity on the relationship between team boundary spanning and team potency. Instead, functional diversity was found to have a linear and positive moderating effect on the relationship between team boundary spanning and team potency (β= 0.10, p<.05). Thus, hypothesis H6 is not supported.

(Insert Table 6 here)

To better interpret the moderating effects of team size and functional diversity on the relationship between team boundary spanning and team potency, we used standard interaction graphing techniques (Figure 2 and 3). Figure 2 depicts the effect of team boundary spanning on team potency at medium, high (+1 SD), and low (-1 SD) levels of team size. In keeping with our hypothesis, the graph shows that the positive effect of team boundary spanning on team potency is greater when team size is medium than when team size is low or high. Figure 3 presents the effect of team boundary spanning on team potency at high, medium and low levels of functional diversity. As shown, the positive effect of team boundary spanning on team potency is stronger when functional diversity is high than when it is medium and low.

(Figures 2 and 3 here)

6. Discussion

The purpose of this study is to advance understanding of how and when team boundary spanning activities affects new product performance. In keeping with our expectations, the results show that team boundary spanning activities can foster a higher perception of potency within NPD teams. Boundary spanning activities facilitate better coordination and synchronization of the NPD activities with other groups inside and outside the company, which helps the NPD team meet deadlines and keep work flowing (Ancona et al., 2002). Moreover, through their boundary spanning activities, NPD teams get access to resources, information and support relevant to the project, and are more likely to partake in both vicarious learning and feedback seeking, factors which, according to Guzzo et al. (1993), can contribute to the development of a team's sense of confidence. A higher sense of team potency, in turn, can result in greater new product quality and new product creativity. Because of their strong conviction that they can deliver high quality work (Guzzo et al., 1993; Lee et al., 2002), NPD teams with high levels of potency are more likely to set high goals for new product quality and expend more time, energy and effort to ensure that they produce a high-quality product. Also, teams with a high sense of potency are more likely to engage in creative-conduce activities and be less deterred by the obstacles that come along the creative process (Tierney and Farmer, 2011), making it more likely to produce products with higher levels of creativity.

Regarding the proposed moderating effects, findings from this study reveal that the effect of team boundary spanning on team potency is contingent on the size of the NPD team and its degree of functional diversity. With regard to team size, the study's results point out an inverted U-shaped moderating effect of team size on the relationship between team boundary spanning and team potency. In particular, we found that the positive effect of team boundary spanning on team potency is greater for medium size teams than for teams of smaller and larger size. Due to their

low headcount, smaller teams are likely to experience work overload as a result of having to manage a myriad of internal activities (e.g., building trust among team members, defining goals, etc.) simultaneously or sequentially to their external activities (Marrone et al., 2007). In the case of larger teams, the communication and coordination problems frequently encountered by these teams (Cannon-Bowers and Bowers, 2011, Cohen et al., 1996; de Cremer and Leonardelli, 2003) can lead to losses in relation to the resources obtained through boundary spanning. As a result, smaller and larger teams will be less likely to derive confidence from their boundary spanning activities.

In relation to functional diversity, the study's findings did not show a curvilinear moderating effect of functional diversity on the relationship between team boundary spanning and team potency. Instead, we found that functional diversity positively moderates the relationship between boundary spanning and team potency, suggesting that for NPD boundary spanning teams, functional diversity is more of an asset than a liability. As noted earlier, functional diversity enables teams to tap into a larger and wider network of external contacts due to their members previously established relationships with individuals from their home units and their similarity in training, goals and perceptions (Ancona and Caldwell, 1992b; Keller, 2001; Scott, 1997). For boundary spanning teams, this advantage of functional diversity implies that team members may be able to readily obtain the resources, support and information sought through their boundary spanning work (Drach-Zahavy and Domech, 2002). This, in itself, may add enough substantive value to the team's boundary work to outweigh any of potential negative effects (i.e., poor internal communication, low team cohesion, increased job stressed) associated with functional diversity.

Finally, in addition to its indirect effect via team potency, the study's results reveal a direct effect of team boundary spanning on new product creativity. This result is in keeping with research

in social networks suggesting that connecting with people outside the team allows team members to get access to a greater number of novel ideas, different perspectives and more diverse information, which can spark the development of new ideas and the adoption of new ways of doing things (Björk, 2012; Hemphälä and Magnusson, 2012; Somech and Khalaili, 2014), hence leading to new products with greater levels of creativity. Interestingly, the direct effect of boundary spanning on new product quality is not significant. A plausible explanation for this result might be that while team boundary spanning activities can provide NPD teams with access to useful input and feedback to improve new product quality (Menon et al., 1997), communication problems may arise between the NPD team and the external parties they interact with which may impede the effective transfer of such information (Homburg and Kuehnl, 2014). Without effective information transfer, the NPD team's ability to develop a high-quality product can be compromised (Sivadas and Dwyer, 2000).

7. Theoretical and managerial implications

The findings of this study contribute to the literature in several ways. First, our study contributes to the literature in team boundary spanning. Since Ancona and Caldwell's (1992a) seminal work on external team activities, there has been an increasing recognition that NPD teams do not function in a vacuum and that team boundary activities are important predictors of innovation and team performance. However, even though boundary spanning is a key activity for NPD teams, and the literature on boundary spanning has been in existence for some years, we do not still have a clear understanding of how and when team boundary spanning works (Birkinshaw et al., 2017). This article addresses part of this knowledge gap by examining one key mediator – team potency– and two important moderators – team size and functional diversity. The study's results show that team boundary spanning influences new product quality and new product

creativity by means of fostering a sense of potency within the team. Also, the positive effect of team boundary spanning on team potency is more pronounced for teams of medium size and high functional diversity.

Second, findings from this study consolidates the relevance of team potency for NPD teams. The notion of team potency is deemed particularly relevant to NPD teams which, given the highly uncertain and complex nature of NPD, often encounter daunting challenges and unexpected difficulties during the development of new products. However, while team potency has been extensively studied in other contexts (e.g., higher education, front-line employees) empirical evidence from NPD teams has been limited to only two studies, mainly Howell and Shea (2006) and Akgün et al. (2007). By revealing that team potency can lead to greater new product quality and new product creativity, findings from this study provide new insights into the benefits of team potency.

Finally, by demonstrating that team boundary spanning positively impacts team potency, this study adds new insights into the determinants of team potency. While prior studies assert that team internal processes (e.g., goal and process clarity, communication, coordination and charismatic leadership), team design variables (e.g. team tenure, functional diversity, group norms and cohesion) and organizational context variables (e.g., support from management and other teams) can impact team potency (de Jong et al., 2005; Tröster et al., 2014; Hu and Liden, 2011), team external processes such as team boundary spanning activity has been left unexplored. As NPD teams increasingly rely on their ability to span functions and organizational boundaries to perform their work (Marrone, 2010), understanding how boundary spanning influences team potency is an important issue that benefits academics and practitioners alike.

Our findings suggest a number of managerial implications. First, findings indicate that firms

should encourage NPD teams to engage in team boundary spanning activities based on the numerous benefits that these activities can offer. Thus, past research shows that boundary spanning activity of NPD teams can positively influence several new product outcomes including adherence to budgets and schedules, technical quality and new product competitive advantage (Ancona and Caldwell, 1992a; Carbonell and Rodriguez-Escudero, 2019; Howell and Shea, 2006). In addition to these benefits, findings from this study suggest that team boundary spanning can also help build team potency which, in turn, contributes to higher new product quality and new product creativity. Engaging in team boundary spanning entails that team members reach outside the team to key individuals inside and outside the organization who can lend support and help them accomplish various aspects of the NPD project. This, however, is easier said than done. As Marrone et al. (2007) noted, team boundary spanning is challenging, and time-consuming and team members need to feel confident that they can perform these activities successfully. In this respect, Marrone et al. (2007) recommend that companies take steps to develop team members' efficacy for taking on boundary-spanning activities by providing them with encouragement. Training is another way by which companies can increase team members' beliefs that they can possess the capabilities to perform team boundary activities. Thus Ancona et al. (2009) suggest that NPD managers provide coaching and tools to help team members focus on the key external activities of scouting, ambassadorship and task coordination.

Secondly, the study's results suggest that smaller and larger NPD teams are not likely to heighten their sense of potency as a result of engaging in team boundary spanning. However, medium-size NPD teams (i.e., teams with approximate nine members) can indeed benefit from the positive effect of team boundary spanning on team potency. As such, managers of medium-size NPD teams should devote sufficient resources to encouraging and supporting their teams'

boundary spanning activities. Lastly, our results show that boundary spanning NPD teams which are heterogenous show higher levels of team potency than homogenous teams. A heterogenous team is more likely to have contacts of greater number and diversity outside the team, an asset that can promote the proficiency with which boundary spanning activities are executed (Choi, 2002), leading then to higher levels of potency within the team. Consequently, managers should staff NPD teams engaged in boundary spanning activities with employees from different functional backgrounds.

8. Limitations and future research lines

The current study has some limitations that should be acknowledged. First, the study results are based on retrospective data. However, as suggested by Dayan and Di Benedetto (2009), the use of retrospective data is acceptable if reported measures are reliable and valid. As discussed earlier, the measures used in our research showed reliability and validity and have also been drawn from existing scales that have been previously validated. Second, data for this study were provided by the team leaders in charge of the sampled NPD projects and thus what the data capture is the team leaders' perception of how their teams are operating rather than the perceptions of the team members themselves. While one can expect team leaders to be familiar with the way projects progress (Hoegl and Gemuenden, 2001), their outlook in matters pertaining to team boundary spanning activities and team potency could diverge from that of team members. Thus, we suggest that future studies test the proposed research model using data from team members. Also, while potency is a team-based concept, data for this study come from a single team member, i.e., the team leader. We thus suggest that future studies test the proposed research model using data from multiple team members from each project. Last, this study was conducted in Spain where collectivism is higher than in other European (e.g., Germany) and North American (e.g., USA)

countries, which may imply that mean levels of team potency might be affected (Earley, 1993; Gibson, 1999). We thus suggest that replication of this study in other countries with an individualist culture could be undertaken to determine empirically the generalizability of our findings.

This study points to some avenues for future research. First, the current study did not measure intervening variables responsible for the effect of boundary spanning on team potency and the effect of team potency on new product quality and new product creativity. These variables should be examined in future research so that the explanatory mechanisms implicated in our study can be tested more stringently. Second, future research could explore the moderating effect of other team characteristics on the relationship between team boundary spanning and team potency. In this regard, it might be interesting to examine the role of interpersonal interactions among team members (Cheng and Yang, 2014). Because team boundary spanning does not only involve reaching outside the team for information, knowledge and support but it also requires transmitting this information back into the team (Marrone, 2010), close and frequent interactions among team members can help in disseminating the knowledge obtained through team boundary spanning to ensure that it reaches to all members in the team as they work in the NPD project. Thus, close interactions among team members could well augment the positive effect of team boundary spanning on team potency. Also, variables that reflect the characteristics of leaders could be relevant moderators of the team boundary spanning-team potency relationship. For instance, past research has shown that a leader's championing behaviors can have important implications for the team boundary spanning. The extent to which a team leader is able to make the NPD team more visible externally, identify important stakeholders and scout the organization for information may serve to enhance a NPD team's boundary spanning activities (Druskat and Wheeler, 2003; Howell

and Shea, 2006; Joshi et al., 2009). Third, it is possible that NPD teams experience failure while performing boundary spanning activities. For example, a NPD team may diligently seek information from outsiders, but the information received may be inaccurate or incomplete causing disruptions in team performance. These negative experiences could damage a team's sense of potency. Still, research on individual's self-efficacy shows that whether substandard experiences affect perceived self-efficacy depends on how individuals construe their ability. In this respect, Wood and Bandura (1989) noted that: "when performances are viewed as skill acquisition in which one learns from mistakes, perceived self-efficacy is unlikely to be adversely affected by substandard performances" (p. 408). In contrast, when ability is construed as a stable entity whereby performance reflects the basic cognitive capabilities that people possess, frequent experience of substandard performance can take a heavy toll on perceived self-efficacy (Wood and Bandura, 1989). Drawing on this research, a fruitful future avenue of research could be to investigate how a NPD team's conception of their boundary spanning capability moderates the relationship between NPD team boundary spanning and team potency. Furthermore, on Wood and Bandura's (1989) premises, future researchers could also explore the moderating effect of psychological safety on the relationship between team boundary spanning and team potency. Psychological safety, which has been defined as the collective belief within a group that members can question existing practices and admit mistakes without suffering ridicule or punishment (Edmondson 1999), could be expected to positively moderate the relationship between team boundary spanning and team potency. Fourth, another fruitful avenue for future research includes examining the relationship between team boundary spanning self-efficacy and team potency. Team boundary spanning activities are challenging and complex and thus, team members will be more likely to partake in these activities when they feel confident in their ability to perform them

successfully (Marrone et al., 2007). Higher engagement in team boundary spanning activities may, in turn, result in stronger levels of team potency[2]. Lastly, future longitudinal research could examine the possibility of a cyclical relationship between team boundary spanning and team potency where team potency would serve as both outcome and input of team boundary spanning. This idea is in keeping with Marks et al. (2001) which introduced the notion of a recurring phase model of team processes. According to Marks et al. (2001), "teams perform in temporal cycles of goal-directed activity called episodes" (p. 359) where "outcomes from initial episodes often become inputs for the next cycle" (p. 360). Drawing on this perspective, there is value in examining whether team boundary spanning can drive and be driven by team potency[3].

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[2] We would like to thank one of the reviewers for raising this relevant and pertinent issue.
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Table 1

Population and sample distribution by industry: Proportion test

Industrial sector	Amadeus directory	Population		Sample	
		N	% of total	N	% of total
Food and beverages manufacturing	813	203	21.5%	23	16.4%
Chemical and plastics product manufacturing	851	213	22.5%	36	25.7%
Machinery manufacturing	490	122	12.9%	15	10.7%
Non-metallic mineral product, primary metal and fabricated metal product manufacturing	781	195	20.6%	21	15.0%
Computer, electronic, and electrical manufacturing	434	109	11.5%*	28	20.0%*
Transportation equipment manufacturing	417	104	11.0%	17	12.1%
TOTAL	3786	946	100%	140	100%

* Significant differences: $p < 0.05$

Table 2

Team boundary spanning dimensions

	Mean (S.D.)	Factor loading
Factor 1. Intra-firm ambassador (CR= 0.87; AVE=0.58)		
Project leader or team members talked up the NPD project to individuals or groups in the company.	5.59 (1.31)	0.823
Persuaded them that the NPD project was important.	5.63 (1.24)	0.808
Persuaded them to support the team's activities and decisions.	5.30 (1.24)	0.835
Kept them informed of the progress on the team's activities to gain support for the project.	5.54 (1.17)	0.640
Built relationship with these groups.	5.21 (1.21)	0.682
Factor 2. Extra-firm ambassador (CR= 0.92; AVE=0.73)		
Project leader or team members talked up the NPD project to individuals or groups outside the company.	5.01 (1.69)	0.870
Persuaded them that the NPD project was important.	4.85 (1.76)	0.881
Persuaded them to support the team's activities and decisions.	4.34 (1.84)	0.871
Kept them informed of the progress on the team's activities to gain support for the project.	4.27 (1.62)	0.813
Built relationship with these groups.	4.99 (1.69)	0.818
Factor 3. Intra-firm scouting-1 (CR= 0.89; AVE=0.81)		
Found out whether individuals or groups inside the company supported the team's activities	4.97 (1.44)	0.903
Found out their expectations about the new product project	5.26 (1.29)	0.896
Factor 4. Intra-firm scouting-2 (CR= 0.91; AVE=0.83)		
Inquired them about new or emergent marketing information and trends.	4.85 (1.54)	0.929
Inquired them about new or emergent technical information and trends.	4.72 (1.70)	0.890
Collected their perceptions about the team and project's progress [a]		
Inquired them about information regarding the company's strategy and climate that could impact the NPD project [a]		
Factor 5. Extra-firm scouting (CR= 0.92; AVE=0.67)		
Found out whether individuals or groups outside the company supported the team's activities.	4.35 (1.82)	0.809
Found out their expectations about the new product project.	4.64 (1.87)	0.861
Inquired them about new or emergent marketing information and trends.	4.69 (1.88)	0.826
Inquired them about new or emergent technical information and trends.	4.84 (1.71)	0.844
Collected their perceptions about the team and project's progress.	4.24 (1.88)	0.756
Inquired them about information regarding changes or early signs of trouble in the external environment	4.93 (1.79)	0.814

Factor 6. Intra-firm task coordination (CR= 0.85; AVE=0.66)		
Negotiated resources (time, money, people) for the team with groups inside the company [a]		
Coordinated with them development and commercialization activities with other individuals or departments.	5.20 (1.48)	0.827
Resolved with them technical and marketing problems that aroused during the development process.	5.76 (1.27)	0.772
Reviewed with them product concepts, preliminary product designs and ideas for marketing plans.	5.49 (1.48)	0.835
Factor 7. Extra-firm task coordination (CR= 0.89; AVE=0.68)		
Procured knowledge and skills relevant to the NPD project from groups outside the company.	3.89 (1.92)	0.679
Coordinated with them development and commercialization activities with interested parties	4.00 (1.75)	0.838
Resolved with them technical and marketing problems that aroused during the development.	4.47 (1.72)	0.902
Reviewed with them product concepts, preliminary product designs and ideas for marketing plans	4.30 (1.85)	0.864

NOTE. Items were measured with 7-point scale where 1 is "totally disagree" and 7 "completely agree".

[a] Items eliminated after exploratory analysis.

CR: Composite Reliability; AVE: Average Variance Extracted

.

Table 3

Quality criteria of formative measurement

Formative second-order construct	Dimensions	Outer weights	VIF[1]
Team boundary spanning	Intra-firm ambassador	0.415**	1.541
	Extra-firm ambassador	0.793**	1.935
	Intra-firm scouting-1	0.177**	1.520
	Intra-firm scouting-2	0.219**	1.396
	Extra-firm scouting	0.807**	2.198
	Intra-firm task coordination	0.414**	1.285
	Extra-firm task coordination	0.761**	1.860

Bias-corrected bootstrap significance levels: ** p<.01, * p<.05 (one-tailed test).

[1]VIF: Variance Inflation Factor.

Table 4

Measurement scales for team potency, moderating variables, new product performance and control variables

	Mean (S.D.)	Factor loadings
Team potency (Guzzo et al., 1993) (AVE= 0.57, CR=0.89)		
The team had confidence in itself.	5.52 (0.99)	0.756
The team believed it could be extremely good at producing high-quality work.	5.87 (1.01)	0.796
The team felt it could solve any problem it encountered	5.14 (1.14)	0.814
The team believed it could be very productive.	5.27 (1.04)	0.847
The team believed that no job was too tough.	4.83 (1.30)	0.693
The team expected to have a lot of influence around here.	4.82 (1.27)	0.613
New product quality (Sarin and Mahajan, 2001) (AVE= 0.55, CR=0.78)		
The product is reliable.	6.10 (0.84)	0.892
Quality of this product compares well with other products developed by our organization.	5.79 (1.08)	0.735
Customers' complaints have been received regarding the poor performance of this product. [R].	5.89 (1.31)	0.540
New product creativity (Rindfleisch and Moorman, 2001**)** (AVE= 0.70, CR=0.92)		
The product offers new ideas to the category.	5.64 (1.18)	0.844
It is very creative.	5.01 (1.49)	0.856
It is very interesting.	5.73 (1.10)	0.845
It is capable of generating ideas for other products.	5.56 (1.30)	0.829
It promotes fresh thinking.	5.22 81.35)	0.817
Team size (Sethi et al., 2001)		
Number of people on the team who were fully involved in the project.	7.49 (6.20)	-
Team functional diversity (Sethi et al., 2001)		
Functional diversity was operationalized as the number of functional areas represented on the team whose members were fully involved in the project	3.45 (1.44)	-
Firm size		
Number of employees in the firm	529.1 (1177.8)	-
Product innovation (AVE= 0.74, CR=0.89)		
We renew the product portfolio by continually launching new and improved products.	5.26 (1.61)	0.923
	4.97 (1.66)	0.886
We invest a significant amount of resources in new product development activities.	4.51 (1.68)	0.761
A high percentage of the company's revenues came from new products introduced during the last two years.		

Team knowledge specialization (Lewis, 2003) (AVE=0.50; CR=0.77)		
Each team member has specialized knowledge of some aspect of our project.	5.56 (1.27)	0.578
Each team member has knowledge about an aspect of the project that no other team member has.	3.90 (1.68)	0.548
Different team members are responsible for expertise in different areas.	4.87 (1.44)	0.678
The specialized knowledge of several different team members was needed to complete the project deliverables.	5.56 (1.35)	0.932
Team coordination (Lewis, 2003) (AVE=0.80; CR=0.89)		
Our team worked together in a well-coordinated fashion.	5.57 (1.09)	0.873
We accomplished the task smoothly and efficiently.	5.01 (1.16)	0.933

NOTE. With the exception of team size and functional diversity, scale items were measured with 7-point scale where 1 is "totally disagree" and 7 "completely agree".

CR: Composite Reliability; AVE: Average Variance Extracted

Table 5

Zero-order correlations and discriminant validity [*]

	1	2	3	4	5	6	7	8	9	10
1. Team boundary spanning	*n.a.*	0.25	0.26	0.32	0.14	0.15	0.12	0.18	0.22	0.17
2. Team potency	0.19*	*0.76*	0.52	0.38	0.08	0.25	0.08	0.23	0.30	0.70
3. New product quality	0.07	0.42**	*0.84*	0.37	0.15	0.09	0.09	0.34	0.32	0.66
4. New product creativity	0.30**	0.34**	0.26**	*0.74*	0.03	0.34	0.08	0.30	0.18	0.17
5. Team size	0.09	-0.03	-0.08	0.03	*n.a.*	0.34	0.23	0.42	0.20	0.02
6. Team functional diversity	0.11	-0.06	-0.11	0.10	0.34**	*n.a.*	0.02	0.15	0.17	0.18
7. Firm size	0.08	0.02	0.03	0.07	0.23**	-0.02	*n.a.*	0.15	0.17	0.05
8. Product innovation	0.06	0.22**	0.22**	0.27**	0.39**	0.14	0.15	*0.86*	0.27	0.15
9. Team knowledge specialization	0.12	0.29**	0.25**	0.17*	0.16	0.15	0.13	0.25**	*0.68*	0.38
10. Team coordination	0.02	0.60**	0.47**	0.15	-0.01	-0.15	0.01	0.11	0.27	*0.89*

[(*)] The italic values on the diagonal show the square root of AVE. Values below the diagonal are the correlations between constructs and the values above the diagonal are the HTMT ratios.

Significance levels: ** p<.01, * p<.05.

Table 6

Standardized parameter estimates

	Model 1	Model 2	Model 3	Model 4	Model 5
Hypothesized relationships					
Team boundary spanning → Team potency	0.14* (H1)	0.14*	0.14*	0.14*	0.14*
Team potency → New product quality	0.30** (H2)	0.30**	0.30**	0.30**	0.30**
Team potency → New product creativity	0.24** (H3)	0.24**	0.24**	0.24**	0.24**
Team boundary spanning * Team size → Team potency		0.10	0.22*		
Team boundary spanning * Team size^2 → Team potency			-0.32* (H5)		
Team boundary spanning * Team diversity→ Team potency				0.10*	0.08
Team boundary spanning * Team diversity^2→ Team potency					-0.04 (H6)
Control relationships					
Team boundary spanning→ New product quality	0.03	0.03	0.03	0.03	0.03
Team boundary spanning→ New product creativity	0.24**	0.24**	0.24**	0.24**	0.24**
Firm size → New product quality	0.09	0.09	0.09	0.09	0.09
Firm size → New product creativity	-0.02	-0.02	-0.02	-0.02	-0.02
Product innovation → Team potency	0.15*	0.15*	0.15*	0.15*	0.15*
Product innovation → New product quality	0.15	0.15	0.15	0.15	0.15
Product innovation → New product creativity	0.21*	0.21*	0.21*	0.21*	0.21*
Team knowledge specialization → Team potency	0.09	0.10	0.10	0.09	0.09
Team knowledge specialization → New product quality	0.12	0.12	0.12	0.12	0.12
Team knowledge specialization → New product creativity	0.01	0.01	0.01	0.01	0.01
Team coordination → Team potency	0.54**	0.52**	0.52**	0.53**	0.54**
Team size → Team potency	-0.04	-0.04	-0.04	-0.04	-0.04
Team size → New product quality	0.17	0.17	0.17	0.17	0.17
Team size → New product creativity	0.00	0.00	0.00	0.00	0.00
Team size^2 → Team potency	-0.17	-0.17	-0.17	-0.17	-0.17
Team size^2 → New product quality	-0.36*	-0.36*	-0.36*	-0.36*	-0.36*
Team size^2 → New product creativity	-0.14	-0.10	-0.10	-0.14	-0.14
Team functional diversity → Team potency	-0.07	-0.06	-0.08	-0.07	-0.06
Team functional diversity → New product quality	-0.23*	-0.23*	-0.23*	-0.23*	-0.23*
Team functional diversity → New product creativity	0.07	0.07	0.07	0.07	0.07
Team functional diversity^2 → Team potency	0.09	0.08	0.08	0.09	0.08
Team functional diversity^2 → New product quality	0.00	0.00	0.00	0.00	0.00
Team functional diversity^2 → New product creativity	-0.02	-0.02	-0.02	-0.02	-0.02
R^2 Team potency	0.44	0.44	0.46	0.45	0.45
R^2 New product quality	0.28	0.28	0.28	0.28	0.28
R^2 New product creativity	0.23	0.23	0.23	0.23	0.23

Significance levels: * p<.05 (one-tailed test); ** p<.01 (one-tailed test).

Figure 1

Theoretical framework

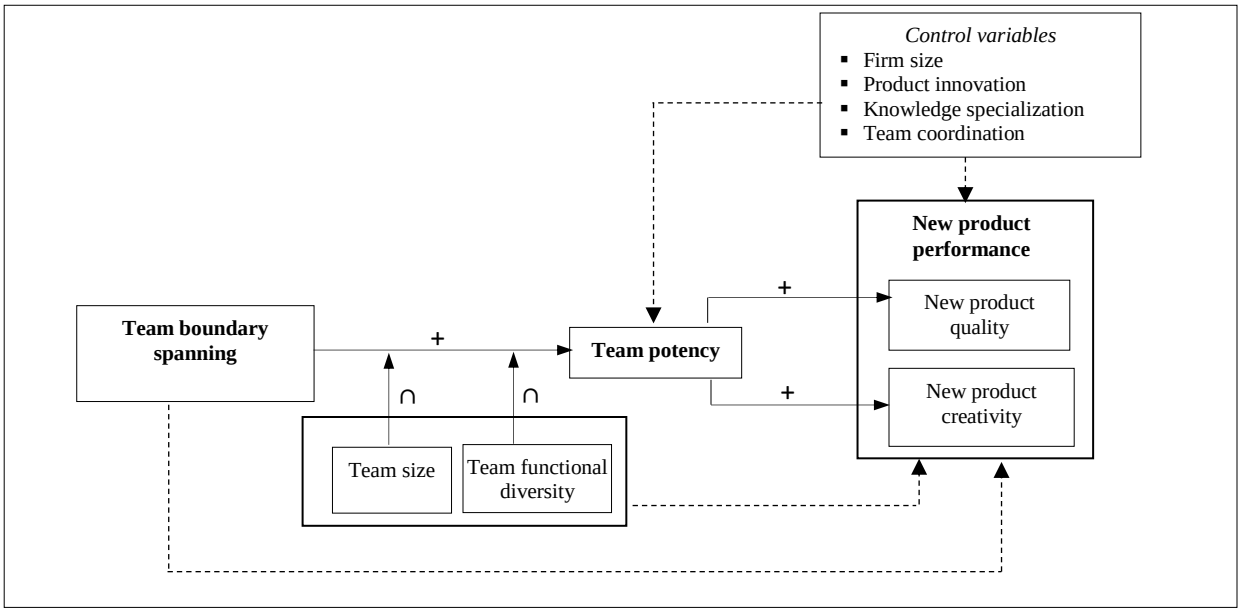

Figure 2

Moderating effect of team size on the relationship between boundary spanning and team potency

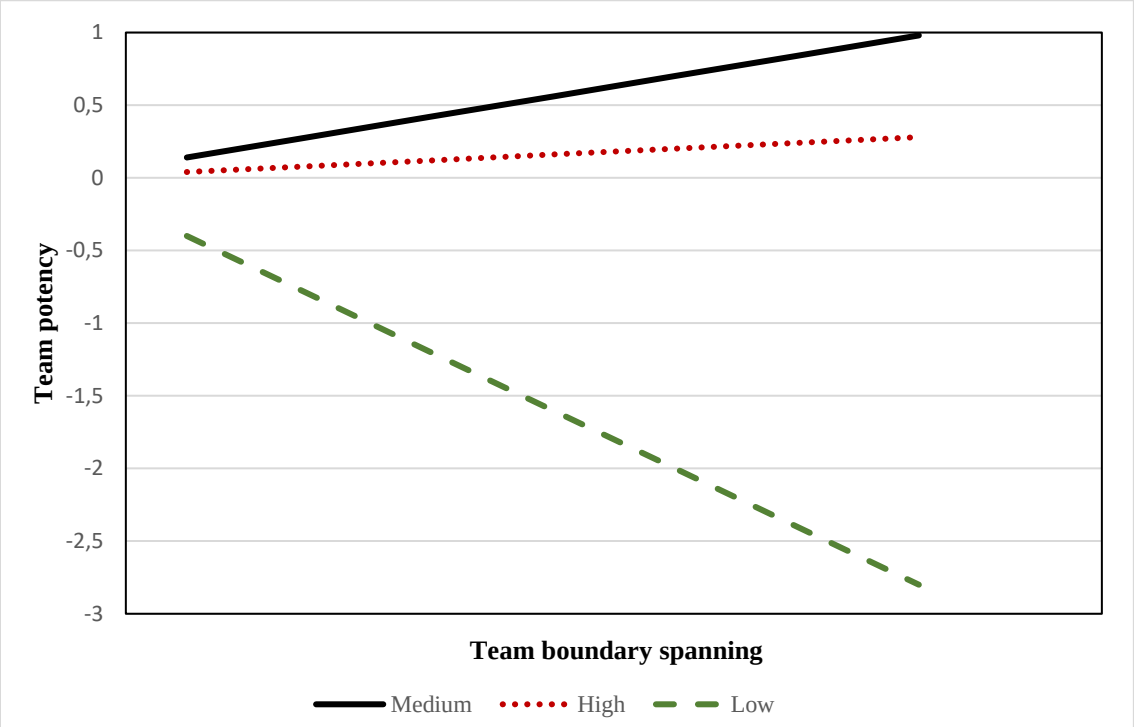

Figure 3

Moderating effect of functional diversity on the relationship between boundary spanning and team potency