Rebecca J. Slotegraaf & Kwaku Atuahene-Gima

Product Development Team Stability and New Product Advantage: The Role of Decision-Making Processes

Innovation scholars have long touted the value of cross-functional teams, and though firms have embraced a cross-functional design in their new product development (NPD) teams, these teams continue to face challenges. Stability in an NPD team may offer important advantages for decision making; however, its effectiveness as a structural coordination mechanism remains largely unexplored. Therefore, to offer insight into the value of NPD team stability, the authors develop a process-based model that examines the extent to which stability influences certain decision-making processes, which in turn influence new product advantage. They examine these relationships with a sample of cross-functional NPD project teams from 208 high-technology firms. The results reveal that the degree of stability in an NPD project team has a curvilinear relationship to team-level debate and decision-making comprehensiveness. In turn, whereas debate is positively related to decision comprehensiveness, decision comprehensiveness is positively related to new product advantage only at high levels. These curvilinear patterns shed light on anecdotal evidence that currently attributes success to both stable and unstable project teams.

Keywords: new product development, teams, stability, decision making

Firms dedicate vast resources in their quest to develop new products that offer an advantage over competition. At the heart of this quest is the knowledge embedded in the cross-functional new product development (NPD) team. The team represents a group of people from different functions who are responsible for the management and coordination of the NPD project (Griffin and Hauser 1992). The rationale for using a cross-functional NPD team is to leverage each member's distinct expertise and knowledge. Transferring knowledge across functional boundaries can generate a valuable strategic asset (Hansen 1999; Maltz and Kohli 1996) as teams create new solutions, products, and services (Atuahene-Gima and Evangelista 2000; Brown and Eisenhardt 1995; Griffin and Hauser 1992). However, the disparate knowledge and perspectives that exist across functions also have the potential to adversely affect cross-functional deliberations and decision making (Dougherty 1992).

To overcome this potential downside of cross-functional teams, firms can adopt an integration mechanism to elevate the team's information sharing and collaboration. One often-used approach is a structural coordination mechanism that focuses on the stability of project team members. In an NPD context, project team stability refers to the extent to which the core members of a cross-functional team remain for the duration of the project, from project approval to product launch. From a knowledge-based perspective, stability stimulates collaboration (Pelled, Eisenhardt, and Xin 1999), thus enabling a cross-functional NPD team to dismantle the knowledge barriers that hinder innovation success (Carlile 2002; Dougherty 1992). However, stability may also pose specific risks. For example, greater stability within a team may impede the sharing of heterogeneous knowledge that can be of great importance for the successful development of new products (Rodan and Galunic 2004). This implies that the relationship among team stability, decision-making processes, and new product outcomes may be more complex than the literature has indicated.

To shed light on these potentially complex relationships, we develop and test a process model in which the degree of project team stability relates to key decision-making processes (i.e., team-level debate and decision comprehensiveness), which in turn relate to new product advantage (i.e., the superiority of a new product's quality, features, and benefits relative to competitors). These two decision-making processes represent important aspects for strategic decision making (e.g., Simons, Pelled, and Smith 1999). Team-level debate is a deliberate process in which team members discuss, challenge, and contest one another's opinions, ideas, and positions about the project's strategies, goal priorities, and overall objectives (Mitchell, Nicholas, and Boyle 2009;

Rebecca J. Slotegraaf is Associate Professor of Marketing and Whirlpool Faculty Fellow, Kelley School of Business, Indiana University (e-mail: rslotegr@indiana.edu). Kwaku Atuahene-Gima is Professor of Marketing and Innovation Management, China Europe International Business School (e-mail: kwaku@ceibs.edu). The authors thank Jason Colquitt; Luigi De Luca; Xueming Luo; Mitzi Montoya; Chris Moorman; and seminar participants at Indiana University, North Carolina State University, and the Product and Development Management Association for their valuable comments. The authors also thank Ma Yuan and Kirsty Weiping for assistance in instrument development, Philip Wang for assistance in data collection, and Lynn Ren for help in data analysis. They also appreciate the generous support of Dow Chemical for the Center of Marketing & Innovation and a research grant from the China Europe International Business School awarded to the second author.

ISSN: 0022-2429 (print), 1547-7185 (electronic)

Simons, Pelled, and Smith 1999). Decision-making comprehensiveness describes the degree to which the team is exhaustive as it considers multiple approaches, courses of action, and decision criteria in its strategic decision making (Fredrickson 1984; Simons, Pelled, and Smith 1999).

The logic for our process model rests on two theoretical foundations. First, according to McGrath's (1984) classic input–process–output (IPO) model, organizational inputs (e.g., team integration structures) influence organizational outputs (e.g., new product advantage) through specific team processes (e.g., decision making). Second, Brown and Eisenhardt (1995) conceptualize the NPD process as a disciplined, problem-solving process that involves many decision-making activities geared toward finding solutions to critical customer problems. Consistent with the IPO model, Brown and Eisenhardt (1995) also make a theoretical distinction between the structural conditions that affect intermediate product development team dynamics and ultimate product outcomes. Consequently, extant research that focuses solely on the direct effect of team structures on ultimate new product outcomes has created a mystery as to the intervening decision-making processes (e.g., De Luca and Atuahene-Gima 2007). Furthermore, extant research that underscores the importance of decision-making processes in NPD (e.g., Atuahene-Gima and Li 2004) has tended to overlook the potential mediating role of these processes between integration mechanisms and ultimate product outcomes. We extend previous research by uncovering the decision-making "missing link" between an integration mechanism (project team stability) and new product advantage.

Overall, this research offers important insight into the complexity surrounding the degree of stability in a cross-functional NPD project team and its link to new product advantage through decision-making processes. Specifically, our results reveal that project team stability has a curvilinear relationship to team-level debate and decision-making comprehensiveness. In turn, a team's level of debate is positively related to its decision-making comprehensiveness, and comprehensiveness has a curvilinear relationship to new product advantage. These results have important implications. In particular, our research illustrates the potentially crucial but complex role of decision-making processes as instruments through which a team's structure (i.e., degree of stability) can enhance new product advantage. The differential effects from these decision-making processes also have important implications for how project teams transfer knowledge across members. Moreover, our results contribute to a better understanding of an important feature identified by group process scholars regarding the role of structure geared toward maintaining relationships and information flow (e.g., McGrath 1984). Although the cross-functional composition of NPD teams offers the potential for specialized knowledge exchange, our research reveals that the degree of stability in an NPD project team is an important driver in the extent to which this potential is realized.

Conceptual Framework

The knowledge-based view (KBV) of the firm points to knowledge as a critical resource for developing a competitive advantage and recognizes that managing knowledge can be a challenge (Grant 1996; Nonaka 1994; Szulanski 1996). Specifically, much of the knowledge that firms and people possess is specialized, tacit, and not easily articulated (Nonaka 1994). When effectively transferred and shared internally, such knowledge increases in value and becomes difficult for competitors to imitate (Argote and Ingram 2000). However, the generation, transfer, and sharing of specialized knowledge in teams can be time consuming and difficult (Szulanski 1996, 2000). In particular, knowledge sharing can be impeded by the tendency to guard and selectively share information (Hansen 1999; Szulanski 1996). Furthermore, because knowledge is localized, embedded, and invested in practice (e.g., Lave 1988), "knowledge boundaries" arise among team members from different functions. Such boundaries hinder interfunctional knowledge sharing and problem solving because of syntax, semantics, and political problems (Carlile 2002, p. 442).

Although these boundaries make work across functions more challenging, the diversity inherent in cross-functional teams provides the potential to produce the specialized knowledge needed for developing new products. Thus, firms find it necessary to use formal integration and coordination mechanisms to facilitate the development of a shared language, interpretation, and understanding to permeate the knowledge boundaries that emerge among project team members (Carlile 2002; Grant 1996). One formalized mechanism is the stability of a team (Akgün and Lynn 2002; Moreland and Argote 2003).

Project Team Stability

Project team stability refers to the extent to which the core members of a cross-functional team remain for the duration of the project, from project approval to product launch. The core members of a cross-functional project team represent a limited group of people from different functions who are responsible for the management and coordination of project activities (e.g., Griffin and Hauser 1992). Over the course of an NPD project, if all core members stay on the team and no changes are made, the team is considered fully stable. In contrast, NPD teams are considered much less stable if core membership frequently changes over the duration of the project.

From a KBV perspective, project team stability may offer the opportunity to attenuate the knowledge transfer problem by stimulating collaboration and encouraging open discussion among team members (Pelled, Eisenhardt, and Xin 1999). For example, when a group is initially formed, members spend some time getting to know one another, and this initial building phase is often marked by guarded exchange in which there is much hidden and unshared information (Tuckman 1965). However, as team members gain working experience with one another over the duration of the project, their interactions are likely to break down the knowledge-sharing barriers (Carlile 2002; Dougherty 1992). Consequently, although team members bring different knowledge bases and "systems of meaning" (Dougherty 1992, p. 183), the degree of stability in the project team is likely to shape their interaction and decision-making processes (e.g., Carley 1991; Pelled, Eisenhardt, and Xin 1999). Figure 1 presents our conceptual framework.

Project Team Stability and Decision-Making Processes

We examine the relationship between team stability and two key decision-making processes: debate and decision comprehensiveness. These two decision-making processes represent important but distinct aspects of strategic decision making (e.g., Simons, Pelled, and Smith 1999). Whereas debate involves challenge in the decision-making process, comprehensiveness involves a process of generating many alternative courses of action, thoroughly analyzing all strategic options, and using multiple criteria in making decisions.

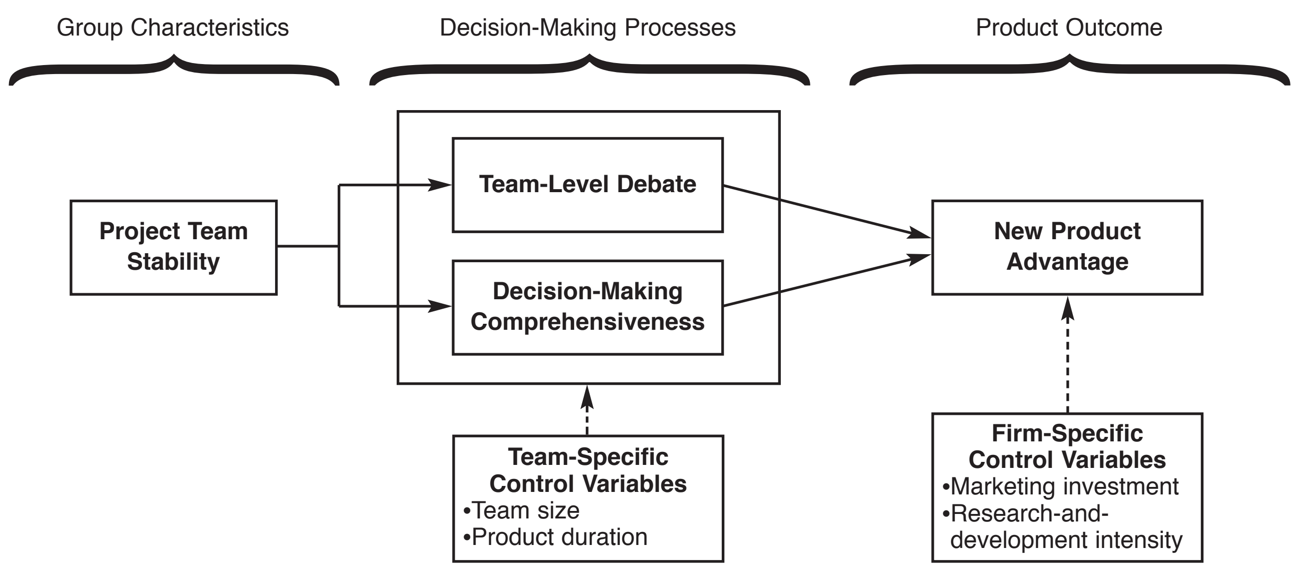
In terms of team-level debate, we argue that the relationship between project team stability and debate is positive up to a certain level of stability. In particular, the increased shared responsibility, group memory, and awareness of team members' problem-solving styles can enhance the manner in which team members share information and discuss issues. As project teams become more stable, there is an increased shared responsibility for the project goals and a greater personal stake in the project outcomes (e.g., Akgün and Lynn 2002). This heightens the search for and sharing of information because individual team members have a vested interest in seeing a successful project outcome. Furthermore, as team member stability increases, it ensures elevated group transactive memory of project activities that allows for coordinated access to each team member's knowledge and expertise (Akgün et al. 2005). This enables a higher level of debate because members have more project-related knowledge and information to frame their different points of view (Lewis 2004). Finally, as team members work together on the NPD project, they develop greater awareness of one another's decision-making styles. This enables team members to express different views and challenge or disagree with one another's ideas with greater candor and less concern about possible backlash (Mitchell, Nicholas, and Boyle 2009; Pelled, Eisenhardt, and Xin 1999).

However, beyond a certain point, too much stability may be detrimental to team-level debate. With greater team stability, the transactive memory system remains intact and offers team members access to a greater degree of teamwide knowledge (Lewis, Lange, and Gillis 2005). Yet research on social entrainment theory (McGrath and Kelly 1986) suggests that when team members develop acute shared transactive memory, they are less likely to publicly challenge one another's ideas. Moreover, the increased social interaction among team members and the greater involvement with the project can suppress the expression of vital alternative or challenging perspectives (Esser 1998). Consequently, we argue that there is an optimal level of NPD project team stability for team-level debate, below which the relationship is positive and above which the relationship is negative.

H_1: Project team stability has a curvilinear relationship to team-level debate, illustrating an inverted U-shaped pattern.

We also expect project team stability to be positively related to decision-making comprehensiveness, up to a certain level of stability. In particular, the increased shared responsibility that greater project team stability facilitates heightens the team's search for more and better information. Indeed, research suggests that team members with a common goal tend to develop a larger pool of high-quality ideas and information by being more open to one another's diverse perspectives (Atuahene-Gima 2003). Moreover, the free flow of information generates a larger quantity of information and ideas for consideration in the decision-making process (Brown and Eisenhardt 1995; Sheremata 2000). The better quality and greater quantity of information

FIGURE 1
Conceptual Model: The Effect of Project Team Stability on New Product Advantage



enable the team to uncover multiple alternatives. Finally, as members of a team continue to work together over the duration of a project, the increased opportunity for interaction and communication enables the team to generate and evaluate many courses of action (LaFasto and Larson 2001).

However, beyond a certain level of project team stability, we expect the relationship between team stability and decision comprehensiveness to be negative. Members of highly stable teams may fail to realistically appraise alternative courses of action (e.g., Esser 1998; Janis 1982). Carley (1986) shows that as members of a stable team become more familiar with project task activities, they begin to make assumptions about the task that cause them to overlook important information. Moreover, they tend to assume that fellow team members hold views similar to their own. By developing shared perspectives on many important issues and making such assumptions, team members fail to collect and consider contradictory information and to analyze key issues deeply. Consequently, higher levels of team stability may limit the degree to which the team is exhaustive and comprehensive in its decision making. Therefore, we expect an optimal level of project team stability for decision-making comprehensiveness, below which the relationship is positive and above which the relationship is negative.

> H_2: Project team stability has a curvilinear relationship to decision-making comprehensiveness, illustrating an inverted U-shaped pattern.

It is possible for debate to occur without decision comprehensiveness (Simons, Pelled, and Smith 1999), such that members propose different options that are not given sufficient consideration. However, we anticipate that the level of debate enhances comprehensive decision making. Greater comprehensiveness reflects a more exhaustive decision-making approach, involving consideration and analysis of a wide array of information and many courses of action (Fredrickson and Mitchell 1984). Team-level debate may elevate the comprehensiveness of a project team's decision making by introducing divergent perspectives and a variety of alternative courses of action. As a result, a greater quantity of information and ideas is generated (Brown and Eisenhardt 1995; Sheremata 2000). Debate can also impel team members to analyze information to a greater extent, thereby ensuring a greater number of options to consider. In support of these arguments, research shows that the degree of debate among top management teams enhances their consideration of multiple alternative courses of action (Talaulicar, Grundei, and Werder 2005). Therefore, we predict a positive relationship between a team's level of debate and its level of comprehensiveness in decision making.

> H_3: NPD team-level debate is positively related to decision-making comprehensiveness.

Decision-Making Processes and New Product Advantage

The problem-solving perspective of NPD (Brown and Eisenhardt 1995) suggests that an NPD project team must leverage its knowledge to develop a superior new product. We argue that team-level debate and decision-making comprehensiveness have a central role in this process. Regarding team-level debate, we expect an initial increase in debate to enhance new product advantage for several reasons. First, as team members challenge assumptions and ideas about critical issues, they have a greater opportunity to synthesize their different perspectives and evaluate different solutions (Amason 1996; Dooley and Fryxell 1999; Jehn 1995). This discussion of conflicting perspectives can raise questions and deliberations about whether the addition of new product features will offer an advantage to consumers over current competitive offerings. Second, as teams engage in debate, it can prevent tunnel vision and inflexibility in problem solving (Brown and Eisenhardt 1995), thus facilitating greater strategic use of market information (Moorman 1995). Finally, debate can encourage project members to delve into issues more deeply and develop a stronger understanding of problems, enabling them to uncover more effective solutions (Jehn 1995). Thus, a key benefit of debate is that it allows differences in perspectives and creativity in customer problem solving, which can elevate the potential for discovering specific features that fit customer needs.

However, beyond an optimal level, we expect further increases in debate to hinder the team's ability to create a superior new product. Specifically, a high level of debate may be detrimental to the process of developing more effective solutions to customer problems. Information error can occur in the debate process that can adversely affect the processing of dissenting information (Dooley and Fryxell 1999). For example, with high levels of debate, a team member may be compelled to provide information, even though the facts are unfounded. A team member may also provide inaccurate information in an attempt to deceive others or promote personal interests. In addition, the information asymmetry and differences in specialized knowledge among team members have the potential to increase internal politics and personal animosity, which are detrimental to finding more effective solutions (Atuahene-Gima and Evangelista 2000). For example, constructive criticisms during debate may be misconstrued as attempts to gain unfair personal or functional advantage or as a challenge to the skills and competence of the team members whose views are criticized (Bourgeois and Eisenhardt 1988). Consequently, we expect an initial increase in team-level debate to enhance new product advantage, but beyond an optimal point, further increases in team-level debate will hinder new product advantage.

> H_4: Team-level debate has a curvilinear relationship to new product advantage, illustrating an inverted U-shaped pattern.

In terms of decision-making comprehensiveness, we expect an initial increase in comprehensiveness to enhance new product advantage. First, comprehensiveness can induce decision makers to examine the environment, the behavior of competitors, and the underlying needs of customers to generate a larger pool of new ideas for new products (Miller, Droge, and Toulouse 1988). As the decision-making approach becomes more exhaustive, it reduces the potential of the project team falling victim to specific cognitive biases associated with incomplete information (Miller

2008). This enables decision makers to become more realistic and effective in their assessments of the environment (Sniezek 1992). Second, as decision comprehensiveness increases, it enables managers to uncover new insights that can enhance the relative advantage of the new product (Dean and Sharfman 1996; Eisenhardt 1989). The greater depth and expansive understanding of the environment increases the likelihood that team members will identify strengths and weaknesses of different alternatives to solving customer problems. Such a process is likely to generate ideas that lead to the discovery of a product that is more advantageous than competing products (Atuahene-Gima and Li 2004). Finally, greater comprehensiveness in the decision-making process reflects greater investment of time and energy in the decision process, which can elevate commitment toward finding and implementing a superior solution (Miller 2008).

However, beyond an optimal level, we expect further increases in decision-making comprehensiveness to involve significant costs that hinder the team's ability to develop a superior new product. From an information-processing perspective, an exhaustive analysis of the situation is likely to produce redundant information that distracts decision makers from the value of useful information (Nisbett, Zukier, and Lemley 1981). Furthermore, complete comprehensiveness can produce new and unfamiliar information to team members (Miller 2008). When this occurs, it becomes inefficient for the team to process the large quantity of unfamiliar information because of problems associated with bounded rationality and information overload. Consequently, we expect an initial increase in decision-making comprehensiveness to enhance new product advantage, but beyond an optimal point, further increases in comprehensiveness will hinder new product advantage.

H_5: Decision-making comprehensiveness has a curvilinear relationship to new product advantage, illustrating an inverted U-shaped pattern.

Method

Sample

Our sample consists of high-technology firms operating in China, given this economy's propensity to engage in product innovation activity (e.g., White 2000). In developing the research instrument, we followed the double-translation method, in which the survey was first prepared in English and then translated into Chinese and then back into English to evaluate the translation accuracy. We pretested the instrument using individual interviews with 17 managers who had at least three years of business experience in China to examine understanding of the survey questions and face validity of the constructs.

From a directory of 2500 high-technology firms provided by a local consulting firm in Shanghai, we randomly contacted 500 firms. From each firm, we collected data from two key informants who were involved in the same recent NPD project. We asked the project leader to select the most recent new product launched within the last three years. We restricted the recall time frame to three years or fewer to minimize problems associated with retrospective data collection (Miller, Cardinal, and Glick 1997). The project leader provided information on project team stability and new product advantage. These informants were research-and-development (R&D) (65%) and marketing (35%) managers and had a mean industry experience of 11.22 years. A second respondent, nominated by the first respondent as knowledgeable of and involved with the project selected, provided data on decision-making comprehensiveness, team-level debate, and the control variables. These informants comprised marketing managers (52%), business development managers (34%), chief executive officers (8%), and R&D managers (6%) and had a mean industry experience of 8.99 years. In addition to using multiple key informants, we further minimized common method bias concerns by offering anonymity and confidentiality to reduce socially desirable responses and assuring key informants that there were no correct or incorrect answers to reduce informant apprehension (Podsakoff et al. 2003).

Overall, we received 208 pairs of usable questionnaires, for a response rate of 42%, with all sampled projects developed by cross-functional teams. To ensure integrity of the data received, we telephoned each informant subsequent to the collection of the completed questionnaire to verify that he or she completed the questionnaire. We motivated respondents by assuring them confidentiality and offering a summary of the research results and a free workshop on the research findings (information that would be meaningless to them in the absence of accurate data). To test for nonresponse bias, we compared a sample of 66 participating firms with a sample of nonparticipating firms for which we had data on R&D expenditures. Analyses of variance indicated no significant differences between the two groups, and a test of early versus late respondents did not indicate significant differences with respect to the measures in the study.

Measures

We adapted measures from previous studies when available or created them specifically for this study. We present all multi-item measures, which relied on five-point Likert scales, and internal fit statistics in the Appendix and detail the measurement results in the next section.

Key variables. Because the length of time each person was a member of the project team was unavailable, we relied on key informants to provide information about team stability. We measured project team stability with five items: two that we created and three drawn from Agkün and Lynn (2002). We assessed the extent to which the informant agreed with statements pertaining to whether different core members of the project team stayed for the duration of the project.

For team-level debate, we relied on a three-item scale adapted from Simons, Pelled, and Smith (1999) that asked respondents to indicate the extent to which the decision making among team members involved disagreement, challenge, and dissent regarding the project's strategies, objectives, and goal priorities. For decision-making comprehensiveness, we adapted a four-item scale from Miller, Burke, and Glick (1998) that asked informants to rate the extent to which decision making in the NPD project involved consideration of a large number of alternatives, multiple criteria for evaluating the alternatives, and extensive examination of opportunities and possible courses of action.

We measured new product advantage with five items that were partially based on the work of Atuahene-Gima and Li (2004). The scale asked respondents to indicate the extent to which the new product provided higher quality than competing products, offered unique benefits, and solved customers' problems more effectively than competitive offerings.

Control variables. In testing our hypotheses, we included additional variables to control for potential extraneous effects. First, we controlled for two team-specific effects on decision-making debate and comprehensiveness. In particular, previous research has shown that the size of the team influences decision-making processes (e.g., Amason 1996; Dooley and Fryxell 1999), and the duration of the project is likely to influence the opportunities to engage in decision making and thus may affect decision-making processes. Therefore, we controlled for potential effects from team size, which we measured as the number of members on the team, and project duration, which we measured as the length of time (in months) it took to complete the NPD project.[1] The average team size was five members, and the average project duration was five months.

Second, we controlled for two firm-specific effects on new product advantage. Because R&D investments may generate better products and improve productivity (e.g., Bean 1995), we controlled for potential effects of R&D intensity, measured as R&D investments as a percentage of sales, on new product advantage.[2] In addition, because investments in marketing research and brand building may generate insights regarding consumer needs, brand strength, and the competitive landscape, we included marketing investment using a two-item measure that captures the extent to which a firm has made significant investments in marketing research and brand building.

[1]We eliminated 13 cases for which project duration was longer than 15 months to reduce potential bias associated with informant recall of the decision-making processes that occurred during the project.

[2]We derive 5% as an appropriate alpha level for our PLS analysis using Murphy and Myors's (2004) statistical power analysis program and therefore judge statistical significance at 5% and 1%.

Analysis and Results

Analysis

To specify the model and estimate the parameters, we used a partial least squares (PLS) estimation approach, which is a component-based structural modeling technique (Wold 1985) that offers specific advantages over covariance-based approaches (e.g., Fornell and Bookstein 1982). Given our sample size and the number of paths to estimate in our model, an important advantage of PLS is that its least squares approach to solving structural equation models demands fewer data points for analysis. In addition, PLS is more appropriate when measures are not well established (Fornell and Bookstein 1982; Wold 1985). To test the curvilinear relationships of project team stability, team-level debate, and decision-making comprehensiveness, we modeled their quadratic terms using the procedure that Ping (1995) recommends. To assess the significance of parameter estimates, we used a bootstrap approach with 200 resamples, with each sample consisting of the same number of cases as the original sample (Efron and Tibshirani 1993).

Measurement Results

In PLS, reliability of individual items is assessed by examining the loadings of the items with their respective latent construct; loadings of less than .5 may represent poorly worded or inappropriate items and thus should be eliminated from the model (Hulland 1999). As the Appendix reports, all measurement items exceed this threshold and load significantly on the expected constructs.

Furthermore, all constructs have acceptable levels of reliability, with the composite reliability coefficients ranging from .84 to .87 for each construct, exceeding the .7 recommended threshold (Nunnally 1978). Convergent validity is also evident, with the average variance extracted (AVE) for each construct ranging between .52 and .71, exceeding the .5 benchmark (Fornell and Larcker 1981). To test for discriminant validity, we used Fornell and Larcker's (1981) approach by examining whether the square root of the AVE of each construct (shown in the diagonal in Table 1) was greater than the correlations between variables. All constructs demonstrate discriminant validity.

Structural Results

Table 2 reports the results for the structural model. Because PLS does not provide statistics to measure overall model fit,

TABLE 1
Descriptive Statistics and Correlation Analysis

	M	SD	1	2	3	4	5	6	7	8
1. Project team stability	3.69	.79	**.72**							
2. Decision comprehensiveness	3.91	.75	.47	**.79**						
3. Team-level debate	3.64	.78	.31	.48	**.82**					
4. New product advantage	3.92	.60	.33	.53	.32	**.75**				
5. Team size	5.01	2.82	.03	.11	.11	.13	**N.A.**			
6. Project duration	5.04	2.95	–.13	.01	–.03	.06	.16	**N.A.**		
7. Marketing investment	3.60	.99	.23	.34	.27	.34	–.08	–.08	**.84**	
8. R&D intensity	3.71	.84	.39	.53	.26	.49	–.03	–.09	.23	**N.A.**

Notes: Correlations of latent variables ≥ .14 are significant at $p < .05$. Diagonal (bold) elements are square roots of the AVE; note that AVE is not applicable for single-item measures (i.e., team size, project duration, and R&D intensity). N.A. = not applicable.

TABLE 2
Structural Results

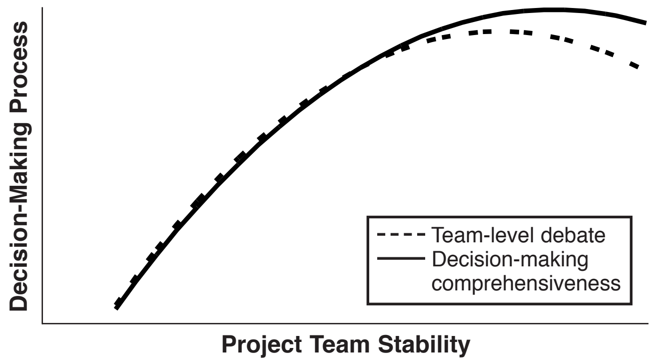
Hypothesized Paths	Path Coefficients
Project Team Stability on Decision-Making Processes	
H_1: Project team stability → team-level debate	.36**
H_1: (Project team stability)^2 → team-level debate	–.13*
H_2: Project team stability → decision-making comprehensiveness	.42**
H_2: (Project team stability)^2 → decision-making comprehensiveness	–.11*
Effects of Decision-Making Processes	
H_3: Team-level debate → decision-making comprehensiveness	.35**
H_4: Team-level debate → new product advantage	–.01
H_4: (Team-level debate)^2 → new product advantage	.06
H_5: Decision-making comprehensiveness → new product advantage	–.25
H_5: (Decision-making comprehensiveness)^2 → new product advantage	.59*
Control Variables	
Team size → team-level debate	.10*
Team size → decision-making comprehensiveness	.05
Project duration → team-level debate	–.01
Project duration → decision-making comprehensiveness	.06
Marketing investment → new product advantage	.17**
R&D intensity → new product advantage	.26**
Explained Variance	
Team-level debate	.12
Decision-making comprehensiveness	.36
New product advantage	.38

*$p < .05$.
**$p < .01$.

the variance explained can be used to assess nomological validity (Hulland 1999), with 38% of the variance explained for new product advantage. In terms of control variables, the results show that team size elevates team-level debate. The results also reveal that firm-specific investments in marketing and R&D are positively related to new product advantage.

Regarding our predicted effects, the results reveal that project team stability has a significant, positive linear and a significant, negative quadratic relationship to team-level debate and to decision-making comprehensiveness. Thus, the results lend support for both H_1 and H_2. To illustrate these relationships further, we plotted the effects across the data range of project team stability (see Figure 2). Evident in this figure are the distinct curvilinear patterns for each of these decision-making processes. In particular, the relationship between project team stability and decision-making comprehensiveness attenuates at high levels of stability,

FIGURE 2
The Relationship Between NPD Project Team Stability and Decision-Making Processes



whereas the relationship between project team stability and team-level debate shows a distinct decrease at high levels of stability. Note that the value of project team stability continues to elevate as the degree of stability increases, and it is not until high levels of stability that declines begin. Thus, to gain the greatest benefits from team-level debate and decision-making comprehensiveness, teams with a moderate to high level of stability seem to be most advantageous.

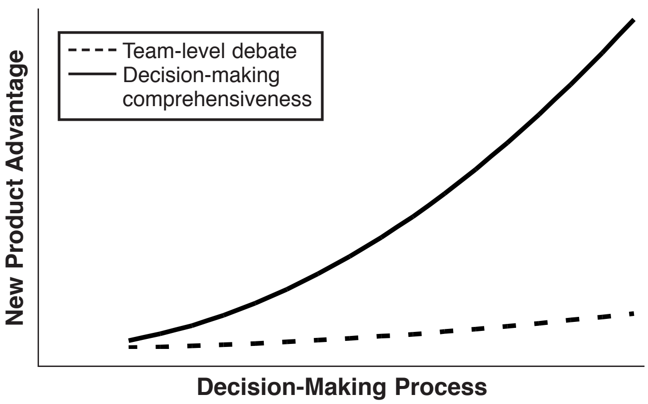
Furthermore, team-level debate has a significant, positive relationship to decision-making comprehensiveness (β = .35, $p < .01$), offering support for H_3, but it does not have a significant relationship to new product advantage. However, the results show that decision comprehensiveness has a nonsignificant linear but a significant quadratic relationship to new product advantage. To illustrate these patterns further, we plotted the effects across the two decision-making processes. As Figure 3 shows, the relationship between team-level debate and new product advantage remains relatively flat, whereas the relationship between decision-making comprehensiveness and new product advantage reveals a curvilinear, increasing relationship. Therefore, as the level of an NPD project team's decision-making comprehensiveness increases, it heightens the team's potential to offer a superior new product.

Consistent with the IPO model (McGrath 1984), the results indicate that the degree of stability in an NPD project team influences the team's decision making in complex ways, and through these relationships, project team stability can have important implications for new product advantage. We present the implications of our results in greater detail in the next section.

Discussion

In this study, we set out to understand better whether the degree of stability in cross-functional NPD project teams influences important team-level decision-making processes and the resulting new product advantage. Our motivation was that though the use of cross-functional teams in innovation can offer many benefits, disadvantages related to bridging the disparate objectives and perspectives can be a substantial hurdle. One approach for overcoming these hurdles

FIGURE 3
The Relationship Between Decision-Making Processes and New Product Advantage



is the degree of stability in cross-functional NPD project teams, a structural coordination mechanism frequently embraced in business practice.

Overall, this research reveals that project team stability can play an important role in the NPD process through its relationship to decision-making debate and comprehensiveness. Consequently, our study provides some support for the use of structural approaches in facilitating knowledge sharing, an idea prominent in the KBV (Grant 1996). Although the intrafirm transfer of tacit, complex knowledge can be time consuming and difficult (Hansen 1999; Szulanski 1996), the degree of stability in an NPD project team can offer value. Our results reveal that the willingness to withhold specific information and the apprehension in sharing sensitive information that often occurs in project teams (Luo, Slotegraaf, and Pan 2006; Stasser and Stewart 1992) may dissipate as team members continue to work with one another over the course of a project. Therefore, the degree of stability in a cross-functional NPD project team can play an important role in permeating functional knowledge boundaries, thus fostering the exchange of crucial knowledge. In brief, the degree of stability in a team has important implications for effective decision making.

However, our results also indicate that teams with high levels of stability face specific obstacles or impediments that diffuse decision-making effectiveness. Specifically, although decision-making debate and comprehensiveness are two important strategic decision-making processes (Simons, Pelled, and Smith 1999), our research reveals that the degree to which an NPD project team engages in these two decision-making processes dissipates at higher levels of stability. A possible explanation for these complex relationships is that team members in a highly stable team have become too comfortable with one another, and so increased amicability across team members occurs. As a result, team-level debate diminishes. It is also possible that members of a highly stable team gain group memory that becomes stagnant. This suggests that the debate and decision-making comprehensiveness in more stable teams reach natural limits unless teams actively engage in seeking external sources of information.

In summary, our results reveal a complex process model that contributes to marketing theory in three main respects. First, we assimilate the role of project team stability into the KBV research stream by highlighting its influence on knowledge transfer and decision making as keys to sustainable advantage (Grant 1996). Although the KBV asserts that knowledge is the most important resource, a fundamental challenge lies in the conversion of knowledge into internal competences for innovation. Addressing the link between project team stability and decision-making processes in cross-functional teams, we offer insight into this challenge and present a new perspective regarding the role of project team stability in NPD. Although marketing scholars have examined the role of decision-making processes, few have examined the key intervening role of decision making in unearthing the inherent value of project team characteristics. By examining these complex linkages, we contribute to the marketing literature and the KBV by highlighting a mechanism by which project team structures could be linked to ultimate project outcomes.

Second, this study contributes to marketing theory by being the first to show empirically that decision-making debate and comprehensiveness have differential effects on new product advantage. In particular, finding that team-level debate affects new product advantage not directly but through decision comprehensiveness is revealing. This has important theoretical implications for how firms and project teams use internal deliberations to foster knowledge transfer in NPD. For example, the unquestionable advantages of debate for enhancing creative thinking may lead scholars to assume that debate is, in and of itself, valuable to project outcomes. We reveal that this assumption may be erroneous by showing that for the firms in our sample, debate becomes valuable for new product advantage only if it facilitates comprehensive decision making. In contrast, our results show that comprehensiveness in the decision-making process is directly valuable for new product advantage.

Contrary to our expectations, we also find that higher levels of comprehensiveness can be more beneficial to generating a superior new product. A possible explanation for this result is that higher levels of comprehensive decision making in a team generate a heightened concentration on important ideas (Dooley and Fryxell 1999) and a better understanding of the market situation and customer problems (Brown and Eisenhardt 1995). A better solution is an indication that the project team was able to focus on the content of important information, generate a better understanding of the competitive landscape, and uncover underlying customer problems to produce a new product that meets customer needs better than competing alternatives. A stronger appreciation of the situation through comprehensive decision making enables the team to be more attuned to market needs and, therefore, less likely to overengineer new products (Rust, Thompson, and Hamilton 2006). It is also possible that the benefits associated with a stable NPD project team help alleviate disadvantages associated with comprehensive decision making. For example, as teams work together throughout the duration of the project, they develop shared norms and coordinated transactive memories that may alleviate information overload from a comprehensive decision-making process. In brief, our results shed a potentially counterintuitive perspective on the underlying value of comprehensiveness. This echoes the complexities that Miller (2008) finds between decision-making comprehensiveness and profitability and suggests that comprehensive decision making has more powerful benefits than previously thought (Atuahene-Gima and Li 2004).

Third, we show that an explicit consideration of how project team characteristics affect the team's decision making is critical for a more complete understanding of the project team's role in the NPD process. In particular, our results show that project team stability offers the potential for specialized knowledge exchange through curvilinear relationships to the debate and comprehensive decision making that occurs in cross-functional NPD teams. This calls attention to the need for explicit consideration of structural and process drivers of new product outcomes.

Managerial Implications

This research holds important implications for managers because project teams are often formed with the purpose of sharing information and coordinating specialized knowledge. Failure to perform these processes can result in inferior decisions and weaker products. Of note is the potential impact of the degree of stability in an NPD project team on the team's decision-making effectiveness. Managers have several controllable project team characteristics at their disposal, such as team size, diversity, geographic location, and functional composition. Our research indicates that project team stability also deserves managerial attention because it involves a complex relationship to decision-making processes that requires caution in the design and management of NPD project teams. It is important to note that because project team stability does not solely offer a beneficial influence in the NPD process, managers should be prudent in determining the extent to which project teams should be designed to remain stable.

Foremost, our research suggests that managers should attempt to form a strong cross-functional team at the initial stage of the project and to limit changes to the team throughout the duration of the project. We acknowledge that it is often difficult for firms to maintain an NPD project team with complete stability. Moreland and Argote (2003) argue that one of the practices that unwittingly prevents companies from leveraging the knowledge embedded in teams is the failure to control member turnover. Therefore, attempting to build stability into an NPD project team should be one of the first initiatives in designing the team.

However, the value of stability on decision-making debate and comprehensiveness diminishes at higher levels of stability. Thus, to attain the benefits associated with stability, explicit procedures or practices can be included in the NPD project process to help foster debate and comprehensiveness. For example, use of devil's advocacy and dialectical inquiry (e.g., Schweiger, Sandberg, and Ragan 1986) may attenuate the negative effects associated with highly stable NPD teams by infusing constructive conflict and critical evaluation in the formal decision-making process. This can also be achieved by actions that enhance the perceived trustworthiness, perceived competence, and loyalty among team members. Such a team atmosphere helps address uncertainties about team members' motives, enhances open communication, and allows members to concentrate on the content of information in the decision-making process (Dooley and Fryxell 1999).

Furthermore, managers should not focus solely on project team stability. Rather, they should be conscious of the nature of the decision-making processes through which the benefits of project team stability are to be achieved. Thus, managers must take a more a holistic view of the linkages among a team's structure, important decision-making processes, and resulting outcomes or goals for the project. In view of our results, managers should institute structural arrangements to ensure vibrant team-level debate and decision comprehensiveness in addition to the structure of the team itself. For example, firms can instill training methods or organizational rewards to encourage constructive debate as well as team environments (e.g., separate meeting rooms) that encourage lengthy and comprehensive discussions. These approaches can help alleviate disadvantages associated with higher levels of team stability. Without a holistic perspective, managers must recognize that the benefits of greater project team stability for new product advantage may not necessarily occur.

Limitations and Directions for Further Research

The goal of this research was to elucidate the role of NPD project team stability in the NPD process. Although we offer insight into the complex role of project team stability, our research contains limitations that indicate different avenues for further research.

First, our measure of project team stability is a subjective measure, in which some items may be interpreted by key informants as either wholly stable or unstable. Further research could address this limitation by pursuing additional measures of stability that are objective or experimentally manipulated. In addition, our measure of NPD project team stability captures the extent to which core team members remain on the project. Thus, consequences from the infusion of instability from the replacement, addition, or elimination of a team member are unknown. Although these latter two examples represent change in team stability over the duration of the project, they also involve change in the size of the team.

Another possible extension would be to explore implications of stability with other team-specific characteristics and at different stages in the NPD process. For example, the concept of stability can be demarcated from team longevity. Team longevity refers to the length of time team members have worked with one another (Katz 1982) and can occur across multiple projects. In contrast, project team stability focuses on a single project, referring to the extent to which team members remain for the duration of a specific project. Consequently, pitfalls associated with high levels of team longevity may not necessarily occur for a team that remains highly stable for a specific project. An extension of our study would be to explore the implications of the interaction between team stability and longevity on key team processes and outcomes. It would also be fruitful to understand when it is more valuable to have team stability at different times in the NPD process. For example, understanding whether higher NPD team stability is more valuable during the early conception stages, when generation of many ideas is important, or during the later implementation stages, when buy-in to the strategy and tactics are critical, would be a useful avenue for further research.

Second, our data are cross-sectional rather than longitudinal. Although this prevents us from testing causality, we do not believe that common method bias is a serious concern in our study. In addition to the efforts we took in the research design to validate the measures, the statistical test for method variance did not reveal any problems. Our use of multiple key informants for different stages of the process model also reduces the problem of common method.

Third, we rely on data from a sample of Chinese firms from a commercial list provider, which thus limits the generalizability of our results. Specifically, scholars have identified several cultural differences among countries. In collectivist cultures, such as China, people tend to place greater importance on harmony and thus tend to avoid open dissent and direct confrontation in decision making. This tendency, coupled with the high importance given to the maintenance of face for oneself and others, suggests that team debate is more likely to have detrimental effects in China. If this is so, our findings are profound in that they show the facilitating role of debate on decision-making comprehensiveness. Thus, the extent to which our results differ from a sample in more individualist and uncertainty-accepting cultures is a fertile area for further research.

Finally, other avenues for further research also exist. One avenue is to explore other new product outcomes to offer additional insight into the value of NPD project team stability. For example, Akgün and Lynn (2002) show that team stability increases speed to market, which is critical for competitive advantage in many hypercompetitive markets. Although we find an increasing relationship between decision comprehensiveness and new product advantage, the effects from comprehensive decision making may differ for speed to market and thus influence the implications from project team stability. Another product outcome is new product creativity. New product creativity is influenced by organization-level knowledge and information (e.g., Moorman 1995), and an underlying tension may exist between new product creativity and the social cohesion among team members (Sethi, Smith, and Park 2001).

Research could also explore the underlying knowledge exchange process in NPD project teams with varying levels of stability as well as the set of possible conditions that may influence the effects from team stability. Although Akgün, Lynn, and Byrne (2006) show that beliefs change as an NPD team changes, further research is needed to understand how knowledge is exchanged within NPD project teams and how this changes as team membership changes over the course of a project. Moreover, new techniques for improving team decision making, such as group support systems (Jessup and Tansik 1991) and the more prevalent use of global virtual teams (Montoya-Weiss, Massey, and Song 2001), indicate the importance of understanding decision-making synergies. This is a critical research direction because several factors (e.g., lack of common syntax, lack of common interpretation of information, distinct functional knowledge in use) impede effectively developing a shared understanding in cross-functional NPD teams. Thus, greater understanding into how project team stability can increase the information processing capacity of a team offers an important avenue for further research.

Conclusions

This research provides an important initial step toward understanding that though the cross-functional composition of NPD teams offers the potential for specialized knowledge sharing, the stability of the team is an important driver in the extent to which this potential is realized. Our core findings alert scholars to appreciate fully the underlying complex relationships that can be driven by structural coordination mechanisms in the NPD process and to recognize the potential differential power of various team structures and decision-making processes. Further research should continue to explore the process activities and mechanisms through which stability and other potential team structures can affect NPD project outcomes.

APPENDIX
Measurement Results

Construct	Description	λ	t-Value
Project Team Stability	•Department managers on the project team remained from beginning to end.	.68	13.7
AVE = .52	•Project team members remained from beginning to end.	.81	24.3
CR = .84	•For the duration of the project there were no changes in the core team members.	.77	24.1
	•Project leader who started the project remained on from beginning to end.	.65	11.3
	•Team membership was stable, core members did not come and go during the project.	.68	13.6
Team-Level Debate	*In making decisions in the project,*		
AVE = .67	•Team members showed disagreement about different goal priorities of the project.	.79	12.7
CR = .86	•Team members had heated debates over the best ways to ensure project success.	.83	23.0
	•Team members showed dissent over the objectives of the project.	.82	22.9

APPENDIX
Continued

Construct	Description	λ	t-Value
Decision-Making Comprehensiveness AVE = .62 CR = .87	*In making decisions in the project, we*		
	•Developed many alternative courses of action.	.79	27.6
	•Used multiple criteria for eliminating possible courses of action.	.76	22.7
	•Engaged in extensive and in-depth analysis of all available strategic options.	.77	18.4
	•Thoroughly examined multiple explanations for problems or opportunities.	.82	30.7
Marketing Investment AVE = .71 CR = .87	*To what extent does your firm compare with your major competitors on the following:*		
	•Investments in marketing research.	.91	32.2
	•Investments in brand building and advertising.	.77	12.2
New Product Advantage AVE = .56 CR = .87	•The quality of the product compared well with similar competitor products.	.76	31.4
	•The product was of higher quality than competing products available to customers.	.78	26.2
	•The product solved problems customers had with competitor products.	.74	21.1
	•The product offered unique benefits to customers.	.75	20.0
	•The product performance met established standards better than competition.	.74	20.9

Notes: All items rely on five-point scales (1 = "strongly disagree," and 5 = "strongly agree"). CR = composite reliability. The results are based on bootstrapping resampling estimation using 200 samples.

REFERENCES

Akgün, Ali E., John Byrne, Halit Keskin, Gary S. Lynn, and Salih Z. Imamoglu (2005), "Knowledge Networks in New Product Development Projects: A Transactive Memory Perspective," *Information & Management*, 42 (8), 1105–1120.

——— and Gary S. Lynn (2002), "Antecedents and Consequences of Team Stability on New Product Development Performance," *Journal of Engineering and Technology Management*, 19 (3–4), 263–86.

———, ———, and John C. Byrne (2006), "Antecedents and Consequences of Unlearning in New Product Development Teams," *Journal of Product Innovation Management*, 23 (1), 73–88.

Amason, Allen C. (1996), "Distinguishing the Effects of Functional and Dysfunctional Conflict on Strategic Decision Making: Resolving a Paradox for Top Management Teams," *Academy of Management Journal*, 39 (1), 123–48.

Argote, Linda and Paul Ingram (2000), "Knowledge Transfer: A Basis for Competitive Advantage in Firms," *Organizational Behavior and Human Decision Processes*, 82 (1), 150–69.

Atuahene-Gima, Kwaku (2003), "The Effects of Centrifugal and Centripetal Forces on Product Development Speed and Quality: How Does Problem Solving Matter?" *Academy of Management Journal*, 46 (3), 359–73.

——— and Felicitas Evangelista (2000), "Cross-Functional Influence in New Product Development: An Exploratory Study of Marketing and R&D Perspectives," *Management Science*, 46 (10), 1269–84.

——— and Haiyang Li (2004), "Strategic Decision Comprehensiveness and New Product Development Outcomes in New Technology Ventures," *Academy of Management Journal*, 47 (4), 583–97.

Bean, Alden S. (1995), "Why Some R&D Organizations Are More Productive Than Others," *Research-Technology Management*, 38 (1), 25–29.

Bourgeois, L.J. and Kathleen M. Eisenhardt (1988), "Strategic Decision Process in High Velocity Environments: Four Cases in the Microcomputer Industry," *Management Science*, 34 (7), 816–35.

Brown, Shona L. and Kathleen M. Eisenhardt (1995), "Product Development: Past Research, Present Findings, and Future Directions," *Academy of Management Review*, 20 (2), 343–78.

Carley, Kathleen (1986), "Knowledge Acquisition as a Social Phenomenon," *Instructional Science*, 14 (3), 381–438.

——— (1991), "A Theory of Group Stability," *American Sociological Review*, 56 (3), 331–54.

Carlile, Paul R. (2002), "A Pragmatic View of Knowledge and Boundaries: Boundary Objects in New Product Development," *Organization Science*, 13 (4), 442–55.

De Luca, Luigi M. and Kwaku Atuahene-Gima (2007), "Market Knowledge Dimensions and Cross-Functional Collaboration: Examining the Different Routes to Product Innovation Performance," *Journal of Marketing*, 71 (January), 95–112.

Dean, James W. and Mark P. Sharfman (1996), "Does Decision Process Matter? A Study of Strategic Decision-Making Effectiveness," *Academy of Management Journal*, 39 (2), 368–96.

Dooley, Robert S. and Gerald E. Fryxell (1999), "Attaining Decision Quality and Commitment from Dissent: The Moderating Effects of Loyalty and Competence in Strategic Decision-Making Teams," *Academy of Management Journal*, 42 (4), 389–402.

Dougherty, Deborah (1992), "Interpretative Barriers to Successful Product Innovation in Large Firms," *Organization Science*, 3 (2), 179–202.

Efron, B. and R.J. Tibshirani (1993), *An Introduction to the Bootstrap*. New York: Chapman & Hall.

Eisenhardt, Kathleen M. (1989), "Making Fast Strategic Decisions in High-Velocity Environments," *Academy of Management Journal*, 32 (3), 543–76.

Esser, James K. (1998), "Alive and Well After 25 Years: A Review of Groupthink Research," *Organizational Behavior and Human Decision Processes*, 73 (2–3), 116–41.

Fornell, Claes and Fred L. Bookstein (1982), "Two Structural Equation Models: LISREL and PLS Applied to Consumer Exit-Voice Theory," *Journal of Marketing Research*, 19 (November), 440–52.

——— and David F. Larcker (1981), "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research*, 18 (February), 39–50.

Fredrickson, James W. (1984), "The Comprehensiveness of Strategic Decision Processes: Extension, Observations, Future Directions," *Academy of Management Journal*, 27 (3), 445–66.

——— and Terence R. Mitchell (1984), "Strategic Decision Processes: Comprehensiveness and Performance in an Industry with an Unstable Environment," *Academy of Management Journal*, 27 (2), 399–423.

Grant, Robert M. (1996), "Toward a Knowledge-Based Theory of the Firm," *Strategic Management Journal*, 17 (1), 109–122.

Griffin, Abbie and John R. Hauser (1992), "Patterns of Communication Among Marketing, Engineering, and Manufacturing: A Comparison Between Two New Product Teams," *Management Science*, 38 (3), 360–73.

Hansen, Morten T. (1999), "The Search-Transfer Problem: The Role of Weak Ties in Sharing Knowledge Across Organization Subunits," *Administrative Science Quarterly*, 44 (1), 82–111.

Hulland, John (1999), "Use of Partial Least Squares (PLS) in Strategic Management Research: A Review of Four Recent Studies," *Strategic Management Journal*, 20 (2), 195–204.

Janis, Irving (1982), *Groupthink*. New York: Houghton Mifflin.

Jehn, Karen A. (1995), "A Multimethod Examination of the Benefits and Detriments of Intragroup Conflict," *Administrative Science Quarterly*, 40 (2), 256–82.

Jessup, Leonard M. and David A. Tansik (1991), "Decision Making in an Automated Environment: The Effects of Anonymity and Proximity with a Group Decision Support System," *Decision Sciences*, 22 (2), 266–79.

Katz, Ralph (1982), "The Effects of Group Longevity on Project Communication and Performance," *Administrative Science Quarterly*, 27 (1), 81–104.

LaFasto, Frank M.J. and Carl Larson (2001), *When Teams Work Best*. Thousand Oaks, CA: Sage Publications.

Lave, J. (1988), *Cognition in Practice: Mind, Mathematics, and Culture in Everyday Life*. Cambridge, UK: Cambridge University Press.

Leonard, Dorothy and Sylvia Sensiper (1998), "The Role of Tacit Knowledge in Group Innovation," *California Management Review*, 40 (3), 112–32.

Lewis, Kyle (2004), "Knowledge and Performance in Knowledge-Worker Teams: A Longitudinal Study of Transactive Memory Systems," *Management Science*, 50 (11), 1519–33.

———, Donald Lange, and Lynette Gillis (2005), "Transactive Memory Systems, Learning, and Learning Transfer," *Organization Science*, 16 (6), 581–98.

Luo, Xueming, Rebecca J. Slotegraaf, and Xing Pan (2006), "Cross-Functional 'Coopetition': The Simultaneous Role of Cooperation and Competition Within Firms," *Journal of Marketing*, 70 (April), 67–80.

Maltz, Eliot and Ajay K. Kohli (1996), "Market Intelligence Dissemination Across Functional Boundaries," *Journal of Marketing Research*, 33 (February), 47–61.

McGrath, Joseph E. (1984), *Groups: Interaction and Performance*. Englewood Cliffs, NJ: Prentice Hall.

——— and J.R. Kelly (1986), *Time and Human Interaction: Toward a Social Psychology of Time*. New York: Guilford.

Miller, C. Chet (2008), "Decisional Comprehensiveness and Firm Performance: Towards a More Complete Understanding," *Journal of Behavioral Decision Making*, 21 (5), 598–620.

———, Linda M. Burke, and William H. Glick (1998), "Cognitive Diversity Among Upper-Echelon Executives: Implications for Strategic Decision Processes," *Strategic Management Journal*, 19 (1), 39–58.

———, Laura B. Cardinal, and William H. Glick (1997), "Retrospective Reports in Organizational Research," *Academy of Management Journal*, 40 (1), 189–204.

Miller, Danny, Cornelia Droge, and Jean-Marie Toulouse (1988), "Strategy Process and Content as Mediators Between Organizational Context and Structure," *Academy of Management Journal*, 31 (3), 544–69.

Mitchell, Rebecca, Stephen Nicholas, and Brendan Boyle (2009), "The Role of Openness to Cognitive Diversity and Group Processes in Knowledge Creation," *Small Group Research*, 40 (5), 535–54.

Montoya-Weiss, Mitzi M., Anne P. Massey, and Michael Song (2001), "Getting It Together: Temporal Coordination and Conflict Management in Global Virtual Teams," *Academy of Management Journal*, 44 (6), 1251–62.

Moorman, Christine (1995), "Organizational Market Information Processes: Cultural Antecedents and New Product Outcomes," *Journal of Marketing Research*, 32 (August), 318–35.

Moreland, Richard L. and Linda Argote (2003), "Transactive Memory in Dynamic Organizations," in *Leading and Managing People in the Dynamic Organization*, R.S. Peterson and E.A. Mannix, eds. Mahwah, NJ: Lawrence Erlbaum Associates, 3–31.

Murphy, Kevin R. and Brett Myors (2004), *Statistical Power Analysis: A Simple and General Model for Traditional and Modern Hypothesis Tests*. Mahwah, NJ: Lawrence Erlbaum Associates.

Nisbett, Richard E., Henry Zukier, and Ronald E. Lemley (1981), "The Dilution Effect: Nondiagnostic Information Weakens the Implications of Diagnostic Information," *Cognitive Psychology*, 13 (2), 248–77.

Nonaka, Ikujiro (1994), "A Dynamic Theory of Organizational Knowledge Creation," *Organization Science*, 5 (1), 14–37.

Nunnally, Jum C. (1978), *Psychometric Theory*, 2d ed. New York: McGraw-Hill.

Pelled, Lisa H., Kathleen M. Eisenhardt, and Katherine R. Xin (1999), "Exploring the Black Box: An Analysis of Work Group Diversity, Conflict, and Performance," *Administrative Science Quarterly*, 44 (1), 1–28.

Ping, Robert A. (1995), "A Parsimonious Estimating Technique for Interaction and Quadratic Latent Variables," *Journal of Marketing Research*, 32 (August), 336–47.

Podsakoff, Philip M., Scott B. MacKenzie, J. Lee, and Nathan P. Podsakoff (2003), "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," *Journal of Applied Psychology*, 88 (5), 879–903.

Rodan, Simon and Charles Galunic (2004), "More Than Network Structure: How Knowledge Heterogeneity Influences Managerial Performance and Innovativeness," *Strategic Management Journal*, 25 (6), 541–62.

Rust, Roland T., Debora V. Thompson, and Rebecca W. Hamilton (2006), "Defeating Feature Fatigue," *Harvard Business Review*, 84 (2), 98–107.

Schweiger, David M., William R. Sandberg, and James W. Ragan (1986), "Group Approaches for Improving Strategic Decision Making: A Comparative Analysis of Dialectical Inquiry, Devil's Advocacy, and Consensus," *Academy of Management Journal*, 29 (1), 51–71.

Sethi, Rajesh, Daniel C. Smith, and C.W. Park (2001), "Cross-Functional Product Development Teams, Creativity, and the Innovativeness of New Consumer Products," *Journal of Marketing Research*, 38 (February), 73–85.

Sheremata, Willow A. (2000), "Centrifugal and Centripetal Forces in Radical New Product Development Under Time Pressure," *Academy of Management Review*, 25 (2), 389–408.

Simons, Tony, Lisa H. Pelled, and Ken A. Smith (1999), "Making Use of Difference: Diversity, Debate, and Decision Comprehensiveness in Top Management Teams," *Academy of Management Journal*, 42 (6), 662–73.

Sniezek, Janet A. (1992), "Groups Under Uncertainty: An Examination of Confidence in Group Decision Making," *Organizational Behavior and Human Decision Processes*, 52 (1), 124–55.

Stasser, Garold and Dennis Stewart (1992), “Discovery of Hidden Profiles by Decision-Making Groups: Solving a Problem Versus Making a Judgment,” *Journal of Personality and Social Psychology*, 63 (3), 426–34.

Szulanski, Gabriel (1996), “Exploring Internal Stickiness: Impediments to the Transfer of Best Practice Within the Firm,” *Strategic Management Journal*, 17 (Winter Special Issue), 17–43.

——— (2000), “The Process of Knowledge Transfer: A Diachronic Analysis of Stickiness,” *Organizational Behavior and Human Decision Processes*, 82 (1), 9–27.

Talaulicar, Till, Jens Grundei, and Axel v. Merder (2005), “Strategic Decision Making in Start-Ups: The Effect of Top Management Team Organization and Processes on Speed and Comprehensiveness,” *Journal of Business Venturing*, 20 (4), 519–41.

Tuckman, Bruce (1965), “Developmental Sequence in Small Groups,” *Psychological Bulletin*, 63 (6), 384–99.

White, Steven (2000), “Competition, Capabilities, and the Make, Buy, or Ally Decisions of Chinese State-Owned Firms,” *Academy of Management Journal*, 43 (3), 324–41.

Wold, Herman (1985), “Partial Least Squares,” in *Encyclopedia of Statistical Sciences*, Vol. 6, S. Kotz and N.L. Johnson, eds. New York: John Wiley & Sons, 581–91.