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Speed or quality? How the order of market entry influences the relationship between market orientation and new product performance

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A B S T R A C T

The role of market orientation as an antecedent of new product performance has been extensively documented in the literature. What is less clear, however, is how firms should make use of their market orientation under different market conditions. This study addresses this question by investigating how market orientation leads to superior new product performance for products that enter the market at different times. In particular, the study examines the moderating effect of order of market entry on the mediated relationship between market orientation and new product performance via product quality and innovation speed. Data from a sample of 244 new product development projects show that a firm's market orientation can improve the performance of first-to-market products and late entrants by facilitating the development of quality products, whereas it can improve the performance of early entrants by facilitating greater innovation speed.

1. Introduction

Successful new product development (NPD) is widely recognized as a critical determinant of firm performance and competitive advantage. By finding new or better solutions to customer problems, NPD can both transform existing markets and create new ones. Without innovation, incumbents slowly lose both sales and profitability as competitors innovate past them (Hauser, Tellis, & Griffin, 2006). In view of the increasing levels of competition and decreasing product life cycles, a firm's ability to develop new products successfully has become more important than ever (Art, Norman, Hatfield, & Cardinal, 2010). However, NPD is a complex and difficult process (Balachandra & Friar, 1997).

The role of market orientation (MO) as a strategically valuable resource for successful NPD has been extensively documented in the literature (Baker & Sinkula, 2005; Grinstein, 2008). However, although there is strong evidence to support the relationship between MO and new product (NP) performance, there is a limited understanding of how firms deploy MO under different market conditions (Ketchen, Hult, & Slater, 2007; Morgan, Vorhies, & Mason, 2009). Drawing upon the resource-based view (RBV) of the firm and contingency theory, we propose a model that addresses this limitation by investigating the way in which MO leads to superior NP performance for products that enter the market at different times. In particular, the study examines the moderating effect of order of market entry on the mediated relationship between MO and NP performance via product quality and innovation speed. The choice of product quality and innovation speed as mediating variables is based on research on order of market entry that regards these variables as important components of pioneers' and followers' NPD strategies (Urban, Carter, Gaskin, & Mucha, 1986; Vakratsas, Rao, & Kalyanaram, 2003).

MO has been shown to increase NP performance through higher product quality (Paladino, 2008) and greater innovation speed (Carbonell & Rodríguez, 2010). However, these routes may involve potential trade-offs. For instance, improving product quality may decrease the speed of development (Crawford, 1992). Therefore, an important question arises: should pioneers (followers) use MO to enhance product quality, or should they use it to speed up NPD? The extant research does not clearly answer this question. For example, whereas some studies describe product quality as being particularly relevant to the success of first-to-market products (Robinson & Fornell, 1985), the question remains how a firm that is slow at developing new products can potentially be a first mover (Kessler & Bierly, 2002). Similarly, there is no convincing evidence on whether followers' primary performance goal during the NPD process should be speed to market or product quality (Vakratsas et al., 2003). The current study attempts to shed some light on this dilemma. Drawing upon a contingent approach to the RBV, we argue that for a particular NP, whether to focus MO on the achievement of superior product quality or greater innovation speed will be contingent on the assumed order of market entry. The effectiveness of MO will be dependent on the use of MO to implement the NPD strategy that is best suited for the specific order of market entry, whether this strategy involves developing high-quality products or accelerating NPD. To date, no prior studies have examined these linkages.

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The study represents an important contribution to the literature in two respects. First, because it combines two major research streams (i.e., the literatures on order of market entry and MO), the study provides new insights into the role of MO in enabling firms to execute NPD strategies that are best suited for a particular order of market entry. The key results of our study indicate that MO can improve the performance of first-to-market products and late entrants by facilitating the development of high-quality products, whereas it can improve the performance of early entrants by increasing innovation speed. Second, the study represents a departure from existing marketing research, which has mainly concentrated on explaining the main effects of order of entry (for exceptions, see Bowman & Gatignon, 1996; Homburg, Bornemann, & Totzek, 2009).

2. Theoretical framework

The traditional RBV of the firm considers resource heterogeneity among firms as fundamental to explaining firm performance (Barney, 1991). This view has been criticized for its inability to explain how resources are developed and deployed to achieve competitive advantage and its failure to consider the impact of market environments (Morgan et al., 2009). However, over time, the RBV has moved beyond its focus on the direct resource-performance link and has evolved into a contingency theory of organizations (Ketchen et al., 2007). Consistent with this recent contingent approach to the RBV, Ketchen et al. (2007: 962) state that "strategic resources only have *potential* value and that realizing this potential value requires alignment with other important organizational elements." Further research indicates that although possessing strategically valuable resources may be beneficial, firms must be able to deploy these resources in ways that match the market conditions they face (Morgan et al., 2009). Building on the contingent approach to the RBV, we propose a moderated-mediation model of the relationship between MO and NP performance. The model that we depict in Fig. 1 illustrates the thesis of this study: that order of market entry moderates the mediated relationship between MO and NP performance via innovation speed and product quality.

MO has been defined as a rare, valuable and inimitable firm-level resource that can generate competitive advantage and lead to superior NP performance (Day, 1994; Hunt & Morgan, 1995; Menguc & Auh, 2006). However, the explication of the routes through which MO influences performance is vital to understand how MO works and how it may be beneficial as a firm's strategic capability (Ketchen et al., 2007; Kirca, Jayachandran, & Bearden, 2005). Focusing on the mediators of the MO–NP relationship, extant research suggests that innovation speed and product quality are important mechanisms through which a firm's MO enhances the success of its NPs. Hunt and Morgan (1995), Paladino (2008) and Pelham and Wilson (1996) suggest that firms with superior MO develop high-quality products because they have a greater understanding of customers' expressed desires and latent needs, competitors' capabilities and strategies and the broader market environment. Just as importantly, MO enables NPD teams to act more quickly on market-related information (Lynn, Akgün, & Keskin, 2003). It also facilitates communication and cooperation and increases goal congruence among the parties involved in the development process (Dougherty, 1992; Moorman, 1995), which has been associated with faster NPD (Gupta, Raj, & Wilemon, 1986; Zirger & Hartley, 1994). A number of studies report a positive association between product quality and NP performance (Henard & Szymanski, 2001; Sethi, 2000) and between innovation speed and NP performance (Ali, Krapfel, & Labahn, 1995; Carbonell & Rodriguez, 2006; Cooper & Kleinschmidt, 1994).

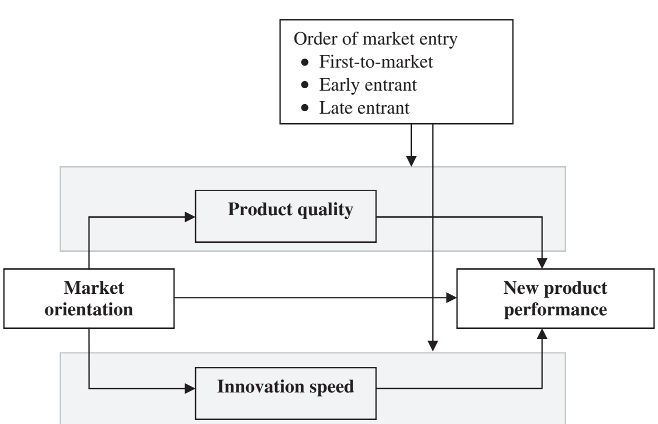

Fig. 1. Conceptual model.

Researchers have recognized the external environment as one of the key constructs for understanding organization behavior and performance in that "the appropriateness of different strategies depends on the competitive settings of businesses" (Prescott, 1986). In our study, we propose that for a particular NP project, whether MO facilitates NP performance via the achievement of superior product quality or greater innovation speed will be contingent on the assumed order of market entry. In other words, as shown in Fig. 1, the order of market entry is expected to moderate the mediated relationship between MO and NP performance. The basic argument underlying our model is that different types of entrants face different market conditions and therefore should prioritize different NPD objectives (i.e., product quality vs. innovation speed). Building on this notion, we posit that for MO to lead to successful NP performance, firms need to be able to deploy their MO in ways that match the expected order of market entry.

In this study, MO is defined as a set of organizational behaviors and processes related to (1) the generation of market intelligence, (2) the dissemination of such information and (3) the responsiveness to that intelligence across departments (Kohli & Jaworski, 1990). NP performance refers to NP outcomes in terms of sales, market share and profitability (Cooper & Kleinschmidt, 1994; Moorman & Miner, 1997). Product quality refers to the overall superiority or excellence of a product (Zeithaml, 1988). Innovation speed, also called NPD speed and speed to market, represents how quickly an idea moves from conception to a product in the marketplace, measuring a team's ability to rapidly develop and launch a NP (Chen, Reilly, & Lynn, 2005).

Three categories of NPs are identified according to the order in which they enter the market: first-to-market products, early entrants and late entrants. Many of the studies on first-mover advantages and disadvantages have not traditionally distinguished between the true pioneer in the market and other early entrants (a notable exception is Robinson, Fornell, & Sullivan, 1992). However, this distinction is critical because a product that enters the market as one of the pioneers (i.e., an early entrant product) faces different challenges and market conditions than a true pioneer does. For example, the true pioneer has no direct competition, but it competes with other product forms already present in the same product category and with substitute product categories that satisfy the same market need and faces the threat of potential entrants. In contrast, early entrants face competition from the one or few products already present in the market. Similarly, an early entrant faces different market conditions than a late entrant does. An early entrant enters the market at the earliest stages of the product life cycle, before the sales of the NP take off, whereas the late entrant follows the pioneer(s) and enters a growing or mature market (i.e., sales of the NP have already taken off) (Agarwal & Bayus, 2004; Robinson et al., 1992).

3. Hypothesis development

Research by Robinson (1988) and Robinson and Fornell (1985) shows that successful pioneering or first-mover firms in both consumer and business markets tend to offer high-quality products. Developing a high-quality product is likely to reduce customers' resistance to change from older product forms to the new offering (Guiltinan, 1999). Product quality also contributes to building customer loyalty, which acts as a barrier to competition (Kerin, Varadarajan, & Peterson, 1992; Lieberman & Montgomery, 1988). According to Schmalensee (1982), once rational buyers have tried a product and have found that it works well, they are not likely to try other products. Furthermore, most of the consumer-based advantages that the literature attributes to pioneering brands (e.g., higher brand awareness, a greater likelihood that the product will be part of consumers' evoked set or become a reference for the product category, favorable brand reputation and positive attitudes on the part of consumers and retail buyers) require the pioneering product to perform satisfactorily (Alpert & Kamins, 1994; Alpert, Kamins, Sakano, Onzo, & Graham, 2001; Carpenter & Nakamoto, 1989; Kardes, Kalyanaram, Chandrashekaran, & Dornoff, 1993). However, innovation speed, albeit relevant, does not seem to be as critical as product quality for first movers (McDonough, 1986). The aim of the first-to-market strategy is to develop a unique and innovative product, which often entails creating or acquiring new knowledge (Garrett, Covin, & Slevin, 2009). Moreover, given the high technological and market uncertainty surrounding the development of first-to-market products, firms will likely spend a considerable amount of time in the research and development phases of the innovation process (Mansfield, Schwarts, & Wagner, 1981). The additional effort that goes into developing a first-to-market product could explain Dyer, Gupta, and Wilemon's (1999) findings, which indicate that the only performance measure on which first-to-market firms failed to perform better than their competitors was the time required to develop new products. For these firms, trying to shorten development time without damaging product quality or significantly increasing development costs may represent a particularly difficult challenge (Sheremata, 2000). Because first movers' primary emphasis seems to be product quality rather than innovation speed, a MO's focus on creating high-quality products should increase the likelihood of success for first-to-market products. MO can help firms to identify unmet customer needs and generate NPs that satisfy them. Therefore, we propose that for first-to-market products, product quality will be a more important intervening variable than innovation speed in the relationship between MO and NP performance.

H1. For first-to-market products, product quality will have a stronger mediating effect than innovation speed on the relationship between MO and NP performance.

Most of the so-called first-mover advantages (e.g., preemption of scarce assets, generation of buyer switching, pioneer's influence on the consumers' learning and preference formation processes) are transitory in that they dissipate with competitive entry (Brown & Lattin, 1994; Huff & Robinson, 1994). Moreover, these advantages are not attributable to just one firm (Gilbert & Birnbaum-More, 1996). Firms entering the market soon after the first mover still have an important opportunity to benefit from some of the advantages associated with early entry (Lieberman & Montgomery, 1988; Varadarajan, Yadav, & Shankar, 2008). For example, entrants that follow shortly after the first-mover enjoy greater opportunities to participate in setting standards for the product category, generate a reputation as market leaders and build switching costs before more competitors enter the market (Brown & Lattin, 1994; Carpenter & Nakamoto, 1989). Taken together, the previous arguments suggest that the shorter the elapsed time between the entry of the first mover and that of early entrants, the more opportunities become available to the latter (Kerin et al., 1992). It then follows that focusing MO on accelerating innovation speed to minimize the period of time during which the first mover is the only brand in the market should increase the likelihood of success of early entrants. Based on the previous discussion, we propose the following:

H2. For early entrants, innovation speed will have a stronger mediating effect than product quality on the relationship between MO and NP performance.

Research indicates that late entrants can reduce market share penalties due to their late entry by focusing on achieving higher consumer preferences (Vakratsas et al., 2003). There are two reasons that support this argument. First, late entrants may not be able to serve as many segments as earlier entrants do, as there are fewer segments available to them due to their late entry (Vakratsas et al., 2003). Second, due to sequential information exposure, products of late movers are less likely to be recalled than those of earlier entrants (Bowman & Gatignon, 1996). Both reasons therefore suggest that late entrants should have a strong incentive to maximize consumers' relative preferences. For late entrants, higher relative preference can be achieved by improving upon the positioning of earlier entrants (Carpenter & Nakamoto, 1990; Cho, Kim, & Rhee, 1998; Green, Barclay, & Ryans, 1995; Lilien & Yoon, 1990; Shankar, Carpenter, & Krishnamurthi, 1998; Urban et al., 1986). In this regard, a number of studies have placed considerable emphasis on the overall quality and innovative features of the products offered by late entrants (Shamsie, Phelps, & Kuperman, 2004). In contrast, innovation speed seems to have very little effect on the early success of late entrants. For example, Shamsie et al. (2004) have shown that if a firm does not manage to move rapidly enough to be included in the group of early entrants, then any further delay does not appear to influence the level of market share that it is able to develop after its entry. Based on the previous discussion, we argue that the benefit of a greater MO for late entrants should come from developing high-quality products rather than from accelerating the time to market. A MO can help firms to find market segments whose demands and tastes are not adequately met by earlier entrants and to design products that are more closely aligned with customer requirements. Therefore, we propose that for late entrants, product quality will be more important to the relationship between MO and NP performance than innovation speed.

H3. For late entrants, product quality will have a stronger mediating effect than innovation speed on the relationship between MO and NP performance.

4. Methodology

4.1. Sample and data collection

The target population for the study was drawn from the Dun and Bradstreet listing of Spanish manufacturing firms. We focused on the following sectors: food, chemicals, plastics, machinery equipment, electrical equipment and transportation. These industries exhibit higher levels of innovative activity than the average manufacturing industry and emphasize product innovation over process innovation (INE, 2009). Only firms with 50 or more employees were chosen from each industry because medium and large firms are more likely to have established NPD procedures than small firms, which tend to have more idiosyncratic practices (Kessler & Chakrabarti, 1999). The target population was composed of a total of 1650 firms.

After seven R&D managers were interviewed for qualitative feedback, the final version of the questionnaire was mailed to the person in charge of NPD activities at each company. Of the 1650 surveys originally mailed, 60 were returned by the post office as undeliverable. From the remaining pool, a total of 247 questionnaires were received. As we explain below, three responses were eliminated from the sample, which yields a response rate of 15.3%. To test for non-response bias, we compared early (first-quartile) respondents with late (fourth-quartile) respondents, as suggested by Armstrong and Overton (1977). No significant differences were found in the mean responses for any of the constructs examined in this study.

On average, the participating firms had 200 employees and €33.85 million in annual revenue. Chi-square analyses revealed no significant differences between our sample of firms and the population in terms of the industry distribution, the number of employees, or sales. Of the respondents, 16% were general managers, 20% were marketing directors and 64% were technical or R&D directors. The results of the analysis of variance and post-hoc Tukey's multiple-comparison tests indicate no statistically significant differences in the mean responses for any of the constructs included in this study across respondents with different functional backgrounds and across firms from different industries.

4.2. Level of analysis

Order of market entry, product quality, innovation speed and NP performance were examined at the project level. Respondents were asked to base their answers on a NP project that had been fully completed within the previous three years and whose development and launch represented a commercial and/or technical challenge for the company. The NP must have been in the market for at least 12 months to ensure that the firm had sufficient data on the product's performance. The core dimensions of MO were measured at the firm level. It is worth noting that relating MO to project-level variables is fairly common among studies attempting to discern how MO influences NP activities and outcomes (Atuahene-Gima, 1995; Langerak, Hultink, & Robben, 2004; Moorman, 1995).

4.3. Measures

Table 1 shows the items used to measure the variables. NP performance was measured using seven indicators: profits, sales and market share relative to both the project's objectives and the competition and overall NP success (Lynn, Reilly, & Akgün, 2000). Product quality was measured using two items reflecting the extent to which the product had reached its quality objectives and outperformed competing products (Tatikonda & Montoya-Weiss, 2001). Innovation speed was measured using three items: launching the product on or ahead of schedule, completing the project faster than its time-based goal and development time compared to what was considered customary for the industry (Akgün & Lynn, 2002; Cooper & Kleinschmidt, 1994; Kessler & Bierly, 2002). MO dimensions (intelligence generation, intelligence dissemination and responsiveness) were measured using a subset of items borrowed from Matsuno, Mentzer, and Rentz (2000).

Order of market entry was measured using a rank-order rating scale. Respondents were asked to indicate whether (1) the firm was the first to introduce such product innovation into the market, (2) it was not the first firm but one of the first, (3) it was an early follower of the pioneer/s, or (4) the NP was launched after most of the competing firms had commercialized their own versions (Miller, Gartner, & Wilson, 1989; Robinson et al., 1992). Because there was no a priori theoretical reason to predict differences in the strength of the mediating effects of product quality and innovation speed between categories 3 and 4 (Shamsie et al., 2004), we reclassified and renamed all observations as follows: *first-to-market* (category 1 in the original classification), *early entrants* (category 2 in the original classification) and *late entrants* (categories 3 and 4 in the original classification).

As noted by Robinson et al. (1992), one limitation of self-reported data on order of market entry is that it increases the number of entrants claiming market pioneer status, which may weaken the empirical results. To assess the validity of our data on order of market entry, we sent a follow-up survey to a second respondent at each firm that had reported first-to-market or early entrant status in the original survey and for which contact information was available. The purpose of this second survey was to assess inter-rater reliability. A total of 32 responses were received, yielding a response rate of 30%. An analysis of the data from the second survey indicated 91% inter-rater agreement. As indicated above, three cases on which there was no agreement were eliminated from the sample. Following Homburg et al. (2009), we tested and confirmed that the order of entry regimes represented decreasing product newness ($M_{First\text{-}to\text{-}market} = 5.58$, $M_{Early\text{-}entrants} = 4.33$, $M_{Late\text{-}movers} = 3.56$; $F = 40.04$, $p < .01$). Product newness was defined as the degree of difference between the NP and those already on the market and was measured on a 7-point scale, where 1 = very low and 7 = very high.

Table 1
Construct definition and measures.

Construct name	Construct measurement
New product performance ($\alpha = .90$, CR = .90, AVE = .56)	The new product met or exceeded profit objectives.[a] The new product met or exceeded sales objectives.[a] The new product met or exceeded market share objectives.[a] New product profits relative to competition.[b] New product sales relative to competition.[b] New product market share relative to competition.[b] Overall new product success.[c]
Product quality ($r = .59$, CR = .74, AVE = .59)	The new product met or exceeded quality objectives.[a] New product's quality relative to competition.[b]
Innovation speed[a] ($\alpha = .77$, CR = .78, AVE = .56)	The project was launched on or ahead of schedule. The project was completed faster than its time-based goal. The project was completed in less time than what was considered normal and customary for our industry.
Intelligence generation[a] (n.a.)	In our business unit, information is periodically gathered on The quality of our products. Customer satisfaction. The needs of our suppliers and intermediaries. The activity of competitors. Changes in the market and the environment.
Intelligence dissemination[a] (n.a.)	In our business unit, the information gathered is: Shared among all the functional departments. Captured in documents. Transmitted rapidly to all functional departments. Discussed among all departments.
Responsiveness[a] (n.a.)	In our unit, the information collected is used to: Respond to changes in our customer needs. Review our product development efforts. Respond to competitor actions. Deal with customer complaints.
Firm size[c]	Firm size relative to its nearest competitors.
Market potential[a] ($r = .52$, CR = .69, AVE = .52)	The current market was growing at a rapid rate. The market offered potential for making profits. The size of the product market was large[d].
Market uncertainty[a] ($r = .64$, CR = .80, AVE = .67)	Uncertainty about customer preferences and tastes was high. Uncertainty about competitive situation was high.

n.a.: not applicable.
[a] Seven-point Likert scale (1 = strongly disagree, 7 = strongly agree).
[b] (1 = worse than competition, 7 = better than competition).
[c] (1 = very small/low, 7 = very large/high).
[d] Suppressed item.

We included relative firm size, market potential and market uncertainty as control variables. Relative firm size was measured as the size of the business relative to that of its main competitors (Slater & Narver, 1994). Large companies, in addition to having more resources, tend to enjoy a competitive advantage because of their reputation (Gatignon, Weitz, & Bansal, 1990). Market potential and market uncertainty have traditionally been considered key antecedents of innovation speed, product quality and NP performance (Atuahene-Gima, Slater, & Olson, 2005; Calantone, Garcia, & Dröge, 2003; Henard & Szymanski, 2001). Market potential and market uncertainty were measured using multi-item scales borrowed from Ali (2000) and Zirger and Maidique (1990).

4.4. Measure validation

This survey included two types of measures: formative and reflective. MO was modeled as a formative second-order construct.

The three first-order components of MO (intelligence generation, intelligence dissemination and responsiveness) are formative indicators of the MO index because these behavioral components together determine the overall level of MO (Coltman, Devinney, Midgley, & Venaik, 2008; Diamantopoulos & Winklhofer, 2001; Diamantopoulos, Riefler, & Roth, 2008; Jarvis, MacKenzie, & Podsakoff, 2003). The three components of MO are themselves considered formative constructs because the corresponding items cover diverse activities that the organization may or may not perform.

Diamantopoulos et al. (2008) have warned that multicollinearity is an undesirable property in formative measurement models. Indicator collinearity was assessed for each component of the MO scale using both variance inflation factors (VIF) and condition numbers (CN). All VIF and CN values were well below the commonly accepted thresholds ($VIF<10$, $CN<30$): information generation (max $VIF=2.0$, max $CN=22.5$), information dissemination (max $VIF=2.6$, max $CN=17.2$) and responsiveness (max $VIF=1.5$, max $CN=16.5$). Therefore, multicollinearity did not seem to pose a problem and all of the items were retained.

The reflective multi-item scales used were NP performance, product quality, innovation speed, market potential and market uncertainty. To assess the unidimensionality of these variables, we calculated item-to-total correlations for each item, taking one scale at a time. Items for which these correlations were lower than .35 were eliminated (Saxe & Weitz, 1982). The values of the Cronbach's alpha coefficients were greater than .70 (see Table 1). The average variance extracted (AVE) and composite reliability exceeded .50 and .60, respectively and the standardized item loadings for all constructs were greater than .50 and significant ($p<.05$). Following MacKenzie, Podsakoff, and Podsakoff (2005), we assessed discriminant validity by examining construct intercorrelations (including those for MO) and their confidence intervals. We verified that all of the correlations were significantly lower than .71, which means that constructs have less than half of their variance in common. In addition, for each reflective construct, we tested that the square root of its AVE was greater than its correlation with the other research constructs (see Table 2). Together, the results of these tests suggested that the reflective scales included in this study were unidimensional, reliable and valid.

For hypothesis testing, the corresponding items were averaged to create a single measure for each construct except for the MO construct, for which, as suggested by Sandvik and Sandvik's (2003), a multiplicative index was created for the three dimensions of MO (generation, dissemination and responsiveness). The empirical literature has traditionally combined the three dimensions of MO as an additive index. However, this approach does not reward balance among the different dimensions. For instance, an organization that gathers a great deal of information but only disseminates some of it or responds to it on a limited basis may receive the same overall score for MO as a company that generates some information, disseminates most of it and responds to most of it. A multiplicative index rewards balance among the three dimensions of MO and thus is more consistent with the theoretical view of MO as a multifaceted concept in which the three dimensions are viewed as mutually dependent (Sandvik & Sandvik, 2003). Table 2 shows the descriptive statistics and correlations for the research variables.

4.5. Common method bias

Most researchers agree that common method variance (CMV) is a potentially serious biasing threat in behavioral research, especially with single-informant surveys. According to Podsakoff, Mackenzie, Lee, and Podsakoff (2003), method bias can be controlled through both procedural and statistical remedies. We addressed procedural remedies by protecting respondent anonymity, reducing evaluation apprehension, improving item wording and separating the measurement of the predictor and criterion variables. We also applied the following statistical remedies. First, we used a confirmatory factor-analytic approach to Harman's one-factor test. All measures of goodness of fit indicated a worse fit for the one-factor model than for the original measurement model. Second, we employed Lindell and Whitney's (2001) marker variable technique. In our case, the extent to which NPD was outsourced, which had previously been found to have no impact on NP quality (Millson & Wilemon, 2008), was designated as the marker variable. Using the formulas suggested by Lindell and Whitney (2001), we computed the CMV-adjusted correlations among the research constructs using the NPD outsourcing-NP quality correlation ($r=.05$) as a proxy for CMV. With the only exception of the MO-market uncertainty correlation, all of the significant correlations remained significant after the CMV adjustment (see Table 2). In summary, results from the above-mentioned tests suggest that CMV is unlikely to affect the findings of this study.

5. Analysis and results

5.1. Mediation model

Prior to testing our moderated mediation hypotheses, we tested the mediating effects of product quality and innovation speed on the overall sample. Both quality and speed were simultaneously included in a multiple mediator model instead of estimating two separate single mediator models, thus reducing the likelihood of parameter bias due to omitted variables (Preacher & Hayes, 2008). Covariance-based path analysis with maximum likelihood estimation (AMOS v18.0) was used to estimate the parameters. Significance levels were based on bias-corrected (BC) bootstrap confidence intervals (CIs).

The initial model was a fully saturated model, a frequent situation in path analysis. However, because several paths were nonsignificant, we re-specified the model by dropping the nonsignificant paths step by step. The revised model fit the data very well ($\chi^2/df=10.03/7$, $p=.19$; $NFI=.95$; $CFI=.98$; $RMSEA=.04$, p close $fit=.53$) and explains 30% of the variance in the dependent variable. However, subsequent analyses were based on the hypothesized model to avoid bias in the parameter estimation due to omitted variables.

For the overall sample, the results in Table 3 provide preliminary insight into the role of product quality and innovation speed as mediators

Table 2
Correlations and descriptive statistics.

	Mean	S.D.	1	2	3	4	5	6	7
1. NP performance	5.07	1.06	**.75**	.41**	.36**	.29**	.14*	.16*	−.16*
2. Product quality	5.72	.93	.44**	**.77**	.31**	.28**	.02	.14*	−.06
3. Innovation speed	4.29	1.18	.39**	.34**	**.75**	.28**	.02	.13*	−.01
4. MO	151.93	71.41	.32**	.32**	.31**	n.a.	.18**	.21**	.09
5. Firm size	4.49	1.41	.18**	.07	.07	.22**	n.a.	.14*	.01
6. Market potential	4.63	1.41	.20**	.18**	.17**	.25**	.18**	**.72**	.27**
7. Market uncertainty	3.63	1.45	−.10	−.01	.04	.13*	.06	.30**	**.82**
8. NPD outsourcing (marker variable)	2.99	2.03	.01	.05	.02	.08	.00	−.05	−.04

Significance levels: **$p<.01$, *$p<.05$ (two-tailed test).
Note: Zero-order correlations appear below the diagonal; correlations adjusted for potential common method bias (Lindell & Whitney, 2001) appear above the diagonal. Bold numbers on the diagonal show the square root of AVE.
n.a.: not applicable.

Table 3
Empirical results: parameter estimates and significance levels.

	Standardized parameter estimates [95% CI]	Standardized parameter estimates [90% CI]		
		Sub-samples[a]		
	Complete sample (n = 244)	First-to-market (n = 66)	Early entrants (n = 70)	Late entrants (n = 102)
Hypothesized relationships				
MO → product quality	.29** [.17, .41]	.24* [.03, .43]	.32** [.13, .50]	.31** [.12, .47]
MO → NPD speed	.29** [.15, .40]	.38** [.21, .53]	.40** [.22, .55]	.08 [−.13, .28]
MO → NP performance	.13* [.01, .26]	.15 [−.02, .33]	.27* [.08, .45]	.08 [−.07, .25]
Product quality → NP performance	.28** [.15, .39]	.40** [.19, .59]	.13 [−.08, .32]	.27** [.11, .43]
NPD Speed → NP performance	.23** [.10, .36]	.15 [−.04, .34]	.35** [.18, .51]	.18 [−.02, .35]
Control relationships				
Firm size → product quality	−.02 [−.15, .11]	−.02 [−.22, .20]	.03 [−.19, .23]	−.12 [−.30, .07]
Market potential → product quality	.13 [−.01, .28]	.28* [.09, .44]	.31* [.06, .52]	.01 [−.19, .23]
Market uncertainty → product quality	−.09 [−.22, .05]	−.12 [−.32, .08]	−.20 [−.41, .02]	−.02 [−.18, .15]
Firm size → NPD speed	−.01 [−.14, .11]	−.10 [−.30, .09]	.01 [−.17, .19]	.00 [−.21, .21]
Market potential → NPD speed	.11 [−.01, .24]	.17 [−.04, .37]	.13 [−.05, .31]	.09 [−.09, .26]
Market uncertainty → NPD speed	−.03 [−.16, .09]	−.09 [−.27, .09]	−.23 [−.41, −.03]	.14[−.03, .31]
Firm size → NP performance	.10 [−.01, .22]	−.01 [−.20, .17]	.07 [−.11, .25]	.09 [−.07, .28]
Market potential → NP performance	.11 [−.01, .24]	.10 [−.10, .29]	.05 [−.11, .21]	.18 [.01, .36]
Market uncertainty → NP performance	−.17** [−.28, −.06]	−.31** [−.49, −.12]	−.08 [−.27, .09]	−.21* [−.37, −.04]
R^2 of product quality	.111	.146	.234	.090
R^2 of innovation speed	.106	.180	.223	.053
R^2 of new product performance	.311	.413	.408	.235

*p<.05, **p<.01 (one-tailed test for hypothesized relationships and two-tailed test for control relationships). Significance levels are based on BC bootstrap CIs.
[a] Sum of subsample sizes is less than the total sample due to missing data.

of the relationship between MO and NP performance. The data show that MO has a positive effect on NP performance (b = .13, p < .05), product quality (b = .29, p < .01) and innovation speed (b = .29, p < .01). Product quality and innovation speed are, in turn, positively related to NP performance (b = .28, p < .01; b = .23, p < .01).

Table 4 presents the standardized total, direct, aggregate indirect and specific indirect effects of MO on NP performance via product quality and innovation speed. The significance of the specific indirect effects is calculated using Preacher and Hayes (2008) macro for multiple mediator models because AMOS provides BC bootstrap CIs for the aggregate indirect effect (i.e., via both mediators) but not for the specific indirect effects. Following Iacobucci, Saldanha, and Deng (2007), we include information on the relative magnitude of the direct and indirect effects with respect to the total effect and the relative magnitude of the specific indirect effects with respect to the aggregate indirect effect. The results for the overall sample indicate that the total effect of MO on NP performance is positive and significant as expected (b = .28, p < .01) and that the influence of MO on NP performance is partially mediated by both product quality (b = .08, p < .01) and innovation speed (b = .07, p < .01). The aggregate indirect effect accounts for 52.3% of the total effect of MO on NP performance.

5.2. Moderating effect of order of market entry

We tested hypotheses H1–H3 by splitting the sample into groups representing different market entry timings and assessing the mediating effects of both innovation speed and product quality within each subgroup (Edwards & Lambert, 2007). Of the NP projects in our sample, 66 were first to market, 70 were early entrants and 102 were late entrants. Covariance-based path analysis with maximum likelihood estimation was again used to estimate the parameters for the three subgroups (see Table 3). Table 4 provides the standardized total, direct, aggregate indirect and specific indirect effects of MO on NP performance for each category of entrants. Significance levels are based on bias-corrected (BC) bootstrap confidence intervals (CIs).

As shown in Table 4, for first-to-market products, MO has a positive and significant total effect on NP performance (b = .30, p < .01). A closer examination of the total effect indicates a significant aggregate indirect effect (b = .15, p < .01) but an insignificant direct effect, suggesting complete mediation. The results obtained using Preacher and Hayes's (2008) macro reveal that the specific indirect effect of product quality is positive and significant (b = .09, p < .05) and accounts for 63% of the

Table 4
Summary of standardized total, direct and indirect effects.

MO → NP performance	Complete sample (n = 244)		Sub-samples					
			First-to-market (n = 66)		Early entrants (n = 70)		Late entrants (n = 102)	
Total effect	.28** [.16, .40][a]	100%[b]	.30** [.13, .45][c]	100%	.45** [.28, .60][c]	100%	.18* [.02, .33][c]	100%
Direct effect	.13* [.01, .26][a]	47.7%[b]	.15 [−.02, .33][c]	50.3%	.27* [.08, .45][c]	60.1%	.08 [−.07, .25][c]	44.5%
Aggregate indirect effect	.15** [.09, .22][a]	52.3%[b]	.15** [.04, .29][c]	49.7%	.18** [.10, .31][c]	39.9%	.10* [.02, .21][c]	55.5%
Indirect effect through product quality[†]	.08**	54.5%[d]	.09*	62.8%	.04	22.7%	.08**	84.6%
Indirect effect through innovation speed[†]	.07**	45.5%[d]	.06	37.2%	.14**	77.3%	.02	15.4%

*p<.05, **p<.01. Significance levels are based on BC bootstrap CIs.
Note: Sum of subsample sizes is less than the total sample due to missing data.
[a] 95% BC bootstrap CIs.
[b] Percentage of the total effect.
[c] 90% BC bootstrap CIs.
[d] Percentage of the aggregate indirect effect.
[†] Significance of the specific indirect effects is determined using Preacher and Hayes's (2008) *Indirect Macro*. No bootstrap CIs are reported for the specific indirect effects, as Preacher and Hayes' macro only provides bootstrap CIs for unstandardized effects.

aggregate indirect effect. There is no evidence of statistically significant mediation via innovation speed. It should be noted that it is not likely that this lack of significance can be attributed to possible systematic bias that makes first movers perceive their NPD speed as being high. The mean scores of first movers, early entrants and late entrants for innovation speed are 4.41, 4.50 and 4.08 respectively. Differences across groups are not statistically significant at $p<.05$. Overall, these results support H1.

The results also provide support for H2, which posits that for early entrants, innovation speed has a stronger mediating effect than product quality on the relationship between MO and NP performance. As reported in Table 4, the decomposition of the total effect of MO on NP performance for early entrants suggests partial mediation (total effect = .45, $p<.01$; direct effect = .27, $p<.05$; and aggregate indirect effect = .18, $p<.01$). The results obtained using Preacher and Hayes's (2008) macro reveal a positive and significant indirect effect via innovation speed ($b=.14$, $p<.01$), which accounts for 77.3% of the aggregate indirect effect of MO. However, the specific indirect effect through product quality is not statistically greater than zero. Taken together, these results suggest a partially mediated relationship between MO and NP performance for the group of early entrants, with innovation speed acting as the key intervening variable.

For late entrants, we find a statistically significant total effect of MO on NP performance ($b=.18$, $p<.05$) but an insignificant direct effect of MO on NP performance. The aggregate indirect effect, however, is positive and significant ($b=.10$, $p<.05$). The results obtained using Preacher and Hayes's (2008) macro indicate a positive and significant indirect effect via product quality ($b=.08$, $p<.01$), which accounts for 84.6% of the aggregate indirect effect. No evidence is found of statistically significant mediation via innovation speed. Overall, these results indicate a fully mediated relationship between MO and NP performance via product quality for late entrants. H3 is therefore supported.

5.3. Robustness of the results[1]

In this study, MO was modeled as a multiplicative index for the three components of MO (generation, dissemination and responsiveness). The empirical literature, however, has traditionally combined the three components into an additive index (e.g. Kohli, Jaworski, & Kumar, 1993; Narver & Slater, 1990). Given that our modeling choice, although allegedly superior (Sandvik & Sandvik, 2003), is quite uncommon in the marketing literature, we re-estimated the model to confirm that the use of an additive index did not change the empirical findings. This analysis yielded results similar to those of the original model.

NP performance was measured using a combination of financial (e.g., NP profits) and market-related (e.g., sales and market share) measures of success. To examine whether the use of this mix of performance measures could affect our findings, we tested our hypotheses using two alternative specifications of NP performance (financial performance vs. market performance). The empirical findings for these two dimensions of performance were largely consistent and yielded similar conclusions.

Because of the ability of partial least squares (PLS) to handle small sample sizes (Reinartz, Haenlin, & Henseler, 2009), we re-estimated the model using this technique. For this analysis, we used Ringle, Wende, and Will's (2005) SmartPLS 2.0.M3 software. PLS provided similar results to those derived using covariance-based path analysis.[2]

Finally, we examined the possible endogeneity of order of market entry. Although no a priori theoretical reason was found to predict whether a NPD project with certain entry timing was more (or less) likely to engage in intelligence-related activities, a one-way ANOVA followed by post-hoc Tukey's tests was performed to examine whether the mean scores for MO differed based on order of market entry. The results of these tests showed a lack of statistically significant differences between levels of MO for the three groups of entrants at $p<.05$.

6. Discussion and implications

Consistent with previous research (Baker & Sinkula, 2005; Grinstein, 2008; Kirca et al., 2005), the findings from this study highlight the importance of MO for NP performance. Overall, a superior MO enables firms to increase their product quality and innovation speed because it drives the continuous and proactive scrutiny of customer needs, encourages efforts to meet those needs and emphasizes greater information use (Atuahene-Gima, 1996; Baker & Sinkula, 2005). Higher product quality and innovation speed are, in turn, related to superior NP performance. Our results also indicate that MO has a direct effect on NP performance. This supports previous research that indicates that MO can have a positive impact on NP performance by, for example, positively affecting the degree of cooperation between departments during the development process (Atuahene-Gima, 1995), the degree of creativity of NPD and related marketing programs (Im & Workman, 2004) and proficiency at development tasks (Langerak et al., 2004). Firms should therefore strive to improve their MO.

Our results suggest a contingent effect of order of market entry on the mediating roles of product quality and innovation speed in the relationship between MO and NP performance. More specifically, our results reveal that for first-to-market products, the effect of MO on NP performance is fully mediated by product quality alone. MO appears to enhance product quality and innovation speed; however, it is through product quality that MO improves NP performance. Product advantage is consistently the most important product characteristic in explaining the trial and adoption of NPs (Gatignon & Robertson, 1985). Using MO to develop high-quality products can help firms introducing first-to-market products to ensure sufficient market penetration before the competition has time to react.

The results for the group of early entrants show that in addition to its direct effect, MO improves NP performance through innovation speed. Unlike first movers, early entrants must develop innovations quickly. Short response times are necessary to prevent market pioneers from gaining access to distribution channels or developing a positive reputation among customers (Carpenter & Nakamoto, 1989; Kerin et al., 1992; Lieberman & Montgomery, 1988). Furthermore, reducing their development time can also be useful for early entrants to strengthen their competitive position before more competition arises (Brown & Lattin, 1994). A strong MO can enable early-entrant firms to speed up the development of NPs, increasing the likelihood of market success. For early entrants, the relationship between product quality and NP performance is not significant.

Our results for late entrants indicate that the benefits of being market oriented come from developing high-quality products rather than from accelerating the time to market. Therefore, MO has a positive relationship with product quality, which in turn is positively related to NP performance. By actively scanning the market environment and then analyzing, distributing and using the resulting insights to inform project-related decisions, a firm that enters the market late can offer a NP that is superior in quality to those of early entrants. There is, however, little to gain from accelerating NPD. Our data show that for late entrants, the associations between MO and innovation speed and between the latter and NP performance are not significant.

From a managerial perspective, our findings suggest that to maximize the value of MO for NP performance, firms should use MO to improve product quality or innovation speed depending on the specific order of entry of the NP. However, order of market entry is not necessarily within the firm's sphere of influence; there are often a number of uncontrollable factors that can influence the order in which a NP would enter the market

[1] Detailed results of these analyses are available from the authors upon request.

[2] We chose to use covariance-based path analysis rather than PLS as our primary estimation method because (1) covariance-based SEM outperforms PLS in terms of parameter consistency (Reinartz, Haenlin, & Henseler, 2009) and (2) the data in PLS are typically standardized prior to the analysis, which may not be appropriate for complex mediation models such as ours (Cheung, 2009).

(Calantone, Yeniyurt, Townsend, & Schmidt, 2010; Homburg et al., 2009; Lieberman & Montgomery, 1988). Therefore, the implication for firms is that they should remain vigilant to shift the emphasis from speed to quality or vice versa during the development of the NP should the expected order of market entry changes. However, can a firm quickly shift its priorities during the development process?[3]

A system that offers firms the possibility to adjust NPD priorities to changing market conditions is the Stage-Gate process.[4] Although the Stage-Gate process has endured for many years, it has evolved significantly over time. The traditional Stage-Gate process was often criticized for its lack of flexibility in dealing with changing market conditions and for lengthening development times (O'Connor, 1994; Sethi & Iqbal, 2008). However, today's Stage-Gate process bears little resemblance to the original model. For example, over the last few years, this process has proven to be more flexible, allowing key activities and even entire stages to overlap. It has also become a much more adaptable innovation process, one that adjusts to changing conditions and fluid information as development proceeds (Cooper, 2008). It then appears that the modern Stage-Gate process is well suited for situations where a NPD team may need to shift the project's focus from speed to quality or vice versa to reflect changes in the order of market entry of the NP project.

7. Limitations and directions for future research

This research is subject to several limitations. First, given the diversity of the industries covered in the study, we based our analysis on perceptual data. For example, the order of market entry variable was measured on a subjective categorical scale. Future research using a more continuous and objective measure of this variable (e.g., the numerical position in the sequence of entrants controlling for the elapsed time since the entry of the pioneer; see Geyskens, Gielens, & Dekimpe, 2002) could be useful in helping us to assess the robustness of our findings. Second, the product quality measure captured the respondents' overall perceptions regarding the quality of the NP. However, product quality is a multi-dimensional construct. It is then plausible that certain characteristics of quality could have greater explanatory power than others in clarifying NP performance across different groups of entrants.

Third, a single key informant provided the data for the independent and dependent variables at each company. Although the results of all the tests reported in the methodology section indicated that common method bias is not a significant problem, future research should attempt to use multiple informants, if possible from different functional areas because prior studies have shown that managers from different departments hold different views regarding the role and importance of marketing (Kohli et al., 1993; Kahn, 2001). Fourth, the response rate is relatively low. As a result, the size of the sub-samples is small, which hampers the achievement of adequate statistical power to detect significant relationships. Finally, as shown by Coffman and MacCallum (2005), summing or averaging the scale items prior to estimating the structural parameters of the model can lead to biased parameter estimates. Therefore, Coffman and MacCallum (2005) recommend that a full SEM model be used for hypothesis testing whenever possible.

This study also identifies a number of areas in which future research could prove fruitful. First, the underlying logic of our hypotheses about the moderating effect of order of market entry is based on the importance of unmeasured factors (e.g., participation in setting standards, switching cost, the existence of competitive space, etc.). Although this practice of deriving a testable hypothesis is frequently used in the marketing literature, we believe that the utilization of direct measures for the underlying factors could offer useful additional insights into the proposed moderating effect. Second, because the launch stage represents the most costly and risky part of the NPD process (Langerak et al., 2004), another interesting avenue of research could be to examine which types of launch activities are most effective in converting MO into superior NP performance across NPD projects with different market entry timings. For example, proficiency in market testing might be the key mediator of the MO–NP relationship for first-to-market products, whereas proficiency in launch tactics might be the key mediator for late entrants. Finally, it could be relevant to investigate to what extent the entry-order strategy for a particular NPD project should be consistent with the general business strategy. For example, does the consistency (or inconsistency) between the business strategy and the assumed order of market entry affect NP performance? In other words, can or should a firm pursuing a low-cost strategy, for example, use its MO to enhance NP quality instead of accelerating product development?

8. Conclusion

This study makes an important contribution to the marketing literature by formulating and testing a model that examines the role of order of market entry as a moderator of the mediating effects of innovation speed and product quality on the MO–NP performance relationship. The findings indicate that the performance of first-to-market products, early entrants and late entrants seems to be related to the specific use that firms make of its MO, whether it is developing high-quality products or accelerating innovation speed. In particular, our results reveal that firms can improve the performance of first-to-market products and late entrants by using MO to develop high-quality products, whereas they can improve the performance of early entrants by using MO to increase innovation speed. Because order of market entry is not entirely under firms' control, firms should remain sufficiently flexible to shift their MO focus between product quality and innovation speed as market conditions change in the short run. That said, from a managerial perspective, the relevance of our findings lies on the firms' ability to quickly adjust their NPD priorities when the actual order of market entry is different from that initially expected.

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[3] We are grateful to the review team for raising this interesting question.

[4] Stage-Gate is a trademark of Product Development Institute Inc.

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