Psychosocial antecedents of communication, trust, and relationship effectiveness in new product development projects: a functional manager perspective

Elias Kyriazis, University of Wollongong
Paul Couchman, Deakin University
Lester W Johnson, Melbourne Business School
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Elias Kyriazis¹, Paul Couchman² and Lester W. Johnson³

¹School of Management and Marketing, Faculty of Commerce, University of Wollongong, Wollongong, NSW, Australia. keliau@uow.edu.au
²School of Management and Marketing, Deakin University, Melbourne, Vic., Australia. hosmm@deakin.edu.au
³The University of Melbourne, Melbourne, Vic., Australia. L.Johnson@mbs.edu

The basic differences between marketing managers and their technically trained counterpart managers [e.g., research and development (R&D), engineering, and manufacturing managers] in terms of work experience, training, and differing decision-making styles have often been suggested as a source of conflict, which acts as a barrier to effective working relationships and integration during new product development (NPD) work. In this paper, we empirically explore this issue by developing and testing a model of psychosocial differences (thought worlds and psychological distance) between the two groups of managers and their effect on communication, trust, and relationship effectiveness during NPD projects. We find that while thought world differences do still matter, it was from a marketing perspective that they had a stronger effect. These findings have implications for top management trying to manage the functional manager interface during NPD projects. We propose a semi-formalized approach to relationship building that may speed up the acquisition of social data that is often necessary to elevate working relationships to trusting ones and improve the efficiency of NPD work. Our model is tested using data from two samples, 184 technically trained managers and 145 marketing managers from Australian companies involved in NPD work.

1. Introduction

Modern managers play a boundary spanning role within their organizations and inevitably need to work through critical ties on which their departments depend. Under conditions of uncertainty and complexity, requiring mutual adjustment, sustained effective coordinated action is only possible where there is mutual confidence or trust (McAllister, 1995). This description of managerial work describes
the reality of functional managers involved in new product development (NPD) work, where there is potential for high uncertainty due to new tasks and new technology, fluid consumer markets, the need to use expertise outside of their own functional area, and the requirement to coordinate action with managers from areas such as sales and marketing, research and development (R&D), design, engineering, and operations (Wheelwright and Clark, 1992). Hence, is sustained effective NPD coordinated action only possible where there is mutual confidence or trust between functional managers?

Unfortunately, we can not yet fully answer that question as there are relatively few NPD-specific studies focusing upon managerial working relationships and trust, the notable exception being from this journal with Dayan et al. (2009) investigating the role of procedural justice and transactional leadership on managerial trust and NPD team performance. While the study of trust is emerging within NPD, it has focused on NPD collaboration between firms (Bstelier, 2006), trust in virtual teams (Bierly et al., 2009), or viewed trust as an aspect of harmonious relations between marketing and the technical functions (Soudier, 1981, 1988; Pinto et al., 1993; Lassawalla and Sashittal, 1998; Song et al., 2000; Calantone et al., 2002; Hausman et al., 2002; Brockenman et al., 2010) but have not fully addressed the role of trust, a key relationship variable (Morgan and Hunt, 1994) in the context of NPD work and cross-functional managerial relationships.

It is our contention that functional managers who trust their counterpart are more likely to have an effective working relationship than those who do not trust them. The NPD process is not a mechanized production line where inputs are received and then automatically transformed into finished products; it relies on human actors interacting successfully with one another and is one of the organizations riskiest processes in terms of career and reputation for the individuals involved. So we argue that the NPD process has much to gain from a more effective working relationship because of the existence of trust. We delve deeper than team, departmental or intra-firm relations, and examine the antecedents of communication, interpersonal trust, and relationship effectiveness between the key marketing decision maker (e.g., marketing manager) and their functional counterpart (e.g., the R&D manager, engineering manager, and manufacturing manager) during NPD project work. This is an important issue as Maltz et al. (2001) found that during cross-functional information transfer, the quality of the relationship between sender and receiver has implications for the way information is used for NPD decision making.

Our approach is consistent with studies of trust within the sales/marketing interface (Dawes and Massey, 2006), dyadic knowledge transfer within firms (Levin and Cross, 2004) and featured prominently within the marketing literature in relation to its benefits for external working relationships: buyer-seller relationships (e.g., Dwyer et al., 1987; Anderson and Narus, 1990; Ganesan, 1994; Doney and Cannon, 1997; Sivadas and Dwyer, 2000), and distribution channel relationships (Anderson and Weitz, 1989, 1992; Gundlach et al., 1995), and recently, marketing collaborations during joint ventures (Fang et al., 2008).

In this paper, we address a significant gap in the NPD literature by examining the antecedents of interpersonal trust and its effect on cross-functional working relationships at the managerial level. We do so as there is considerable theoretical and empirical support for the role of trust in enhancing performance outcomes. Trust allows people to economize on information processing and safeguarding behaviors and makes decision making more efficient by simplifying the acquisition and interpretation of information (McEvily et al., 2003). Interpersonal trust also has other benefits for working relationships. Williams (2001) argues that trust reduces the need to monitor others' behavior, formalize procedures, and create specific contracts. It also facilitates informal cooperation and reduces negotiation costs, making it invaluable to organizations that depend on cross-functional teams, inter-organizational partnerships, temporary work groups, and other cooperative structures to coordinate work. Mutually trusting partners communicate more openly and solve problems more effectively (Zald, 1972; Anderson and Weitz, 1989). As a result of trusting, there is facilitation of joint action and coordination among interdependent partners and a diminished need for hierarchical and/or legalistic controls (Granovetter, 1985; Achrol, 1991).

It seems that managerial level trust has many potential benefits for building effective working relationships within the fast, fluid, and time-pressured NPD project environment. Much of the seminal work examining cross-functional working relationships was undertaken in the context of R&D/marketing relationships during NPD projects where Gupta et al. (1985a), by surveying both R&D and marketing managers, identified 19 areas of integration ranging from setting new product goals and priorities, preparing budgets, screening new ideas, to finding commercial applications for new technologies that involve high levels of interaction. Extending this work, Gupta et al. (1985a) identified five key barriers to integration: (1) communication barriers around critical customer requirements, development schedules,
and market needs; (2) insensitivity to other's capabilities and perspectives; (3) lack of senior management support; (4) personality and cultural differences; and (5) lack of market knowledge. Trusting relationships in such dynamic environments offer efficiencies for all of the participants, in particular, for R&D managers who rely on marketing to hear the 'voice of the customer' and help interpret it and create new product solutions to satisfy their needs.

Similarly, managers involved in the marketing/ manufacturing interface need to make process and product development decisions, tactical forecasting for strategic planning, marketing/sales planning involving the management of demand, forecasting decisions, sales target determination, and the timing of product/sales promotions (O'Leary and Flores, 2002; Malhotra and Sharma, 2002).

Many of these NPD-related interactions are with new people due to the increased use of temporary task teams and reduced loyalty to organizations resulting in increased managerial turnover (McKnight et al., 1998). An increased use of communication technology has also resulted in working on virtual teams, which can be globally dispersed (Jarvenpaa and Leidner, 1999). Managers are developing new working relationships regularly with very few cues, either interpersonal or organizational, as to the other managers' capabilities (Meyerson et al., 1996). In essence, they have to trust their counterparts who are fundamentally very different in many ways: training and work history (Shaw and Shaw, 1998), culture and thought worlds (Dougherty, 1992), language and information styles (Souder and Moenaert, 1992; Moenaert et al., 1994), personality and time orientation (Saxberg and Stolnitz, 1968). It is only during the course of their NPD interactions that managers will be able to assess the capabilities and intent of the functional managers that they have to work together with. Once they have enough social data for trust to develop, the working relationship will begin to work beyond formalized job requirements (Howland et al., 1953; Blau, 1964; McKnight et al., 1998; Dirks, 1999).

Unfortunately, such individual-level differences between functional managers have been credited with causing significant problems for the effective integration of functional specialists resulting in ineffective working relationships especially in terms of effective communication. This problematic communication often leads to a Pandora's box of ailments, i.e., critical information not being passed on, distorted in a detrimental fashion or disregarded by the recipient, projects deliberately delayed that can escalate to 'conflict', or 'disharmony' between marketing and R&D (Souder, 1981, 1988; Shaw and Shaw, 1998). As these managers are the main players in controlling and directing NPD work within their functions as well as often setting the tone for their staff in relation to interdepartmental interactions (Ruekert and Walker, 1987; Fisher et al., 1997), we view this managerial interaction on NPD projects primarily as a trust development process. Our view may seem to be at odds with the widely accepted view that the innovation process 'is essentially informational, ... the transfer of information is therefore the major vehicle that allows individuals to become integrated' (Moenaert and Souder, 1990a, p. 98), which has been validated empirically. An increased volume of information transfer is associated with greater integration between the marketing and R&D functions, and subsequently with a higher level of NPD success (Gupta et al., 1986; Ruekert and Walker, 1987; Moenaert et al., 1992; Griffin and Hauser, 1996). Such research has emphasized the role of formal NPD processes to ensure that communication does flow between functions. However, 'trust was a prerequisite for the transfer of information across functional boundaries and its subsequent use' (Moenaert and Souder, 1990b, p. 221). Although information transfer is one of the fundamental inputs from other functions, we argue that, as a concept, the information transfer approach does not capture the benefits or role of trust on communication and information transfer within working relationships.

We contribute to the literature in several ways by our focus on fundamental psychosocial individual-level differences between managers and examine whether or not these differences have implications for communication, trust development, and relationship effectiveness. First, at the managerial interface, e.g., for R&D managers who are often the first cited example of the existence and effect separate thought worlds in NPD relationships, our focus on the relational antecedents of trust formation has considerable implications for the development of effective working relationships. Our research highlights that is not only appropriate for them to ask a marketing counterpart questions relating to their past NPD experiences and information preferences, that it is a necessary aspect of fast tracking the development of trust and thus more effective working relationships. Second, at the top management level, beginning to view functional integration as a trust-building exercise between functional managers does offer considerable advantages for NPD process efficiency, especially in terms of better and more timely decision making with time-consuming formalized and bureaucratic processes can be by-passed where managers trust each other. Finally, at the theoretical level, managerial-level
cross-functional working relationships are far better than previously described, allowing research to move beyond overcoming conflict and disharmony to a more positive focus on higher level relationship development, those based on trust.

The remainder of the paper is structured as follows. Next, we present the theoretical and conceptual framework and hypotheses. We then describe our methodology and details regarding the measurement and operationalization of our variables. Last, we discuss our results and their implications, limitations of the paper, and directions for future research.

2. Conceptual framework and hypotheses

There have generally been two approaches taken in the management literature in regard to the concept of interpersonal trust. One approach has viewed trust as a belief or an expectation about an exchange partner’s trustworthiness that results from the partner’s expertise, reliability, or intentions (Blau, 1964; Rotter, 1967; Schurr and Ozanne, 1985; Dwyer et al., 1987; Anderson and Weitz, 1989). This is cognition-based trust, where ‘trust is the belief in the ability, integrity, and motivation of the other party to act in service of the needs and interests as agreed upon implicitly or explicitly’ (Mittal, 1996, p.232). The second approach to trust views it as a behavior or behavioral intention that reflects a reliance on a partner and involves vulnerability and uncertainty on the part of the trustee (Deutsch, 1960; Zald, 1972). This is affect-based trust, where trust is the subjective feeling of being secure against exploitation in a relationship and of having the comfort that comes from assurance of having one’s interests served by another party (Mittal, 1996).

Similarly, many researchers in the social science literature have also focused on trust as being a confidence about another party acting with benign or benevolent intentions (Deutsch, 1960; Moorhman et al., 1992; Morgan and Hunt, 1994). Specifically, Deutsch (1958, 1960) in a series of experiments that focused on trust, trustworthiness, and suspicion found that positive trust expectations exist of others from people who are actually trusting in nature themselves. In corollary, those people who do not act in a trusting manner display untrustworthy behaviors to others. A key finding was that an individuals trust expectations are directly affected by the motivational expectation of third-party action. This finding has formed the basis of the expectation perspective associated to third-party actions when examining the concept of interpersonal trust.

Mayer et al. (1995) argued that it is the willingness to make oneself vulnerable to risk that defines the act of trust and provided the following definition of trust as the ‘…willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustee, irrespective of the ability to monitor or control that other party’ (p. 712). However, several researchers (McAllister, 1995; Mital, 1996) have argued that conceptualizing trust as being either cognitive or affective in nature does not fully cover its multidimensional nature or its effect on trusting behaviors. McAllister (1995) empirically examined interpersonal trust in the context of peer manager working relationships, on both the dimensions of cognitive and the affective trust (Lewis and Wiebert, 1985) where cognition-based trust was defined in terms of individual beliefs about peer reliability, competence, and dependability. Affect-based trust was defined in terms of reciprocated interpersonal care and concern (Rempel et al., 1985; Pennings and Wolczesly, 1987).

It is McAllister’s (1995) conceptualization of trust as two separate but related constructs—cognitive-based trust and cognitive-based trust are used in this study. We feel justified in doing so as cognitive-based trust is relevant for dealing with a functional specialist from another unit who you rely upon for their specialized skills and affect-based trust is a feature of all human interactions in relationships including those in work settings (Meyerson et al., 1996).

Importantly, we also view trust as a two-dimensional construct having both a cognitive and an affective component in contrast to many studies that view trust as multidimensional construct (Buttlar, 2006; Bierly et al., 2009) and thus offer a richer interpretation of its role in relationship formation (McAllister, 1995; Massey and Dawes, 2007). This trust can come from predominantly cognitive or affective base, but it must exist for the efficient processing of information and communication (McAllister, 1995). Further, empirical support for the role of cognitive and affective trust in the receipt of useful knowledge is provided by Levin and Cross (2004) within an organizational context who found a positive effect of both forms of trust on knowledge creation and transfer. Similarly, Massey and Dawes (2007) examine the role of both dimensions of trust during the sales and marketing interface, and find that it has positive effects for functional conflict and relationship effectiveness.

In our model, we draw upon social interaction theory and two dimensions of trust to explain the working relationship between functional managers on NPD projects. We do so because trust researchers
argue that managers in new working relationships will use rapid, cognitive cues or first impressions as opposed to personal interaction to evaluate others' trustworthiness (Lewis and Wiegert, 1985; Meyerson et al., 1996). Our research confirmed this process where many technically trained managers when evaluating their marketing counterpart on an initial meeting tried to establish their bona fide as competent marketers. As greater interaction occurs, Blau (1964) proposed social exchange theory as a way of understanding these human exchange relationships and suggested that trusting behaviors signal interest in, and commitment to, such relationships. When these trusting behaviors are reciprocated, they foster beneficial outcomes for the relationship such as creating a positive atmosphere, reducing or removing barriers of task-related risk, and allowing the relationship to further develop. Interpersonal trust was seen to emerge through the repeated exchange of benefits between two individuals. Social exchange theory also explains the development of the affective aspect of relationships.

These theories are appropriate for the examination of cross-functional relations as the need for such relationships are often formalized in nature with an expectation of that the specialized expertise of another will be used to assist in successful NPD outcomes. Managers must first determine whether or not the other is capable of fulfilling their role requirements. The NPD literature has focused considerable attention on one of the managerial bases for evaluation of functional counterparts, thought world differences, (Dougherty, 1992) and its effect on information transfer, quality perceptions and use, and relationship effectiveness. Thought world differences are classified as psychological variables (Fisher et al., 1997) and are used in our conceptual model.

In our model shown in Figure 1, the antecedent variables are classified under three factors of interest, being (1) counterpart perceptions, (2) communication, and (3) relational factors - with the outcome variable of perceived relationship effectiveness. Specifically, the process variables are (1) thought world differences and (2) psychological distance, as these variables have been found to affect the way managers perceive each other and their information inputs. We use quality of communication as the communication variable as it has been found to be an important determinant of relationship effectiveness, and it captures the cross-functional requirement for communication and information transfer necessary in NPD work. Two dimensions of trust are used in our model to capture the cognitive and affective nature of relationships (McAllister, 1995; Levin and Cross, 2004) and are linked to our outcome variable of perceived relationship effectiveness, which is an assessment of how worthwhile a working relationship is thought to have been.

2.1. Variables

2.1.1. Perceived relationship effectiveness

We use a subjective outcome measure that is consistent with other major studies of marketing's working
relationships, e.g., cross-functional (Ruekert and Walker, 1987), buyer-seller (Anderson and Narus, 1990; Smith and Barclay, 1997), sales and marketing (Dawes and Massey, 2006). Perceived relationship effectiveness is drawn from Van de Ven (1976) and relates to whether the manager perceives their relationship with their counterpart manager to be worthwhile, equitable, productive, and satisfying. This measure is appropriate to use in this context as it captures managers' assessments of the value of working relationships, which is important in terms of commitment to and continuation of such relationships (Morgan and Hunt, 1994).

2.1.2. Thought world differences

In the NPD literature, much emphasis has been placed on breaking down 'functional silos' where functions operate individually and then pass their completed work 'over the wall' to each other (Gupta and Wilemon, 1990; Griffin and Hauser, 1992a). As a result, differences between functions occur in terms of the knowledge, language, and jargon used, procedures, and methods employed, as well as their goal orientations in terms of time and risk. These approaches then become part of the firmly entrenched cultures of these functional groups due to the compartmentalization that occurs. Subsequently, separate 'thought worlds' begin to emerge where a community of persons engaged in a certain domain of activity develops a shared understanding about that activity (Dougherty, 1992). These thought worlds pose particular problems for NPD where departments would selectively filter information and insights and may ignore those from other specialized units even though they may contribute to the problem as a whole. These thought worlds 'share different funds of knowledge and cannot share ideas easily and may view one another's central issues as esoteric, if not meaningless' (p. 182). We define thought worlds differences as the extent to which functional managers' view that they are similar to each other in terms of experience, understanding of marketing, technical and customer matters.

The effect of these thought world differences is not well understood. Milliken and Martins (1996) in their review of the role of diversity in organizations examined the effects of functional background on affective and cognitive outcomes for organizations such as satisfaction, creativity, and turnover. They concluded that diversity can have both positive and negative effects that need to be further investigated. Empirical evidence provides significant support for such constructs as 'cultural thought worlds', 'language barriers', and 'goal differences', which inhibit mutual understanding between marketing and R&D staff (Gupta et al., 1986; Ruekert and Walker, 1987; Ancona and Caldwell, 1992). Recently, Homburg and Jensen (2007) in their examination of the role of thought world differences in the sales/marketing interface found that their existence hampers the cooperation between marketing and sales. Accordingly, we hypothesize that:

H1a: Smaller thought world differences between functional managers will lead to an increased quality of communication.

H1b: Smaller thought world differences between functional managers will lead to increased cognitive-based trust.

H1c: Smaller thought world differences between functional managers will lead to increased affect-based trust.

H1d: Smaller thought world differences between functional managers will lead to increased perceived relationship effectiveness.

2.1.3. Psychological distance

We define psychological distance as the similarities in a functional managers' decision-making style compared with their counterpart manager. We use this measure to account for differences between managers in their functional training relating to problem solving (i.e., analytical technical staff) that may affect the way that joint decisions are made (Shaw and Shaw, 1998). Souder and Moenaert (1992) have identified that functional managers often have differing 'information styles' with differing expectations regarding the information they need for decision making. Fisher et al. (1997) empirically tested the concept of 'psychological distance' in the context of engineering's working relationship with marketing. They found that less psychological distance has a positive relationship with communication behavior, specifically bidirectionality and communication frequency, and also on perceived relationship effectiveness. Accordingly, we hypothesize:

H2a: Smaller psychological distance between functional managers will lead to increased quality of communication.

H2b: Smaller psychological distance between functional managers will lead to increased cognitive-based trust.

H2c: Smaller psychological distance between functional managers will lead to increased perceived relationship effectiveness.
2.1.4. Quality of communication
A key role played by communication in the NPD process is to reduce uncertainty for the key organizational actors in four key areas. These are (1) consumer-related uncertainty relating to their needs and expectations; (2) technology-related uncertainty where companies may be using unfamiliar technologies or creating new ones; (3) competitor-related uncertainty where knowing what offerings currently exist and are likely to be developed is critical; and (4) organizational resource issues where trying to determine what assistance is available in terms of financial, people-based, and political support are key concerns. Information transfers between functional units, and their managers, are a means to achieve this reduction in uncertainty (Moenaeert et al., 1992). Quality of communication is defined in terms of how credible, understandable, relevant, and useful information provided by the counterpart was for their own task completion (Moenaeert et al., 1992; Xie et al., 2003). When marketing information received by R&D is perceived to be high quality, the marketing manager is perceived to be more trustworthy, competent, and knowledgeable (Gupta and Wilemon, 1988). As cognition-based trust concerns work-related competence and professionalism, both of which can be demonstrated via quality communication, and the provision of quality communication should increase cognitive trust. Also, when information provided by marketing is high quality, R&D managers will be better able to achieve individual and joint goals (Gupta and Wilemon, 1988), and will be more likely to perceive their relationship to be effective. We therefore hypothesize:

H3a: Greater quality of communication between functional managers will lead to increased cognitive-based trust.

H3b: Greater quality of communication between functional managers will lead to increased perceived relationship effectiveness.

2.1.5. Cognitive-based trust
Cognitive-based trust is defined as the individual beliefs about peer reliability, competence, and dependability of another (McAllister, 1995). These beliefs occur as a result of reputational effectiveness, functional membership, and direct experience through relational exchange. Several studies have identified the perceived lack of credibility of marketing staff as a major barrier to integration (Gupta et al., 1985b; Gupta and Wilemon, 1988; Souder, 1988) and as such is a major problem when attempting to integrate functions. Moenaeert and Souder (1990b) during in-depth interviews with R&D managers found that marketing information was often screened on the basis of whether or not the source "was competent in their discipline". Gupta and Wilemon (1990) found that R&D managers in high-technology companies were very critical of their organizations' hiring policies regarding marketing staff, where 27% of the R&D managers thought that the marketing managers did not have enough knowledge about marketing to be effective. Shaw and Shaw (1998) examined the relationship between engineers and marketing personnel and found one of the reasons for conflict to be that the marketers were not professionally trained in marketing, and this lead to a lack of credibility. Accordingly we hypothesize that:

H4a: Greater cognitive-based trust between functional managers will lead to increased perceived relationship effectiveness.

Rempel et al. (1985) found strong empirical support for the proposition that relationships can develop from an initial cognitive base, where one perceives the other party to be competent in their specialist field, and then relationships become closer as social interaction leads to the development of affect-based trust. While cognitive trust formation can be viewed as preceding affect-based trust, McAllister (1995) found that cognitive trust had a direct causal effect on affective trust in peer manager relations. It is thought that affective trust forms from an initial perception of the other person as being competent, reliable, and dependable. Accordingly, we hypothesize:

H4b: Greater cognitive-based trust between the functional managers will lead to increased affect-based trust.

2.1.6. Affect-based trust
Affect-based trust is grounded in reciprocated expressions of interpersonal care and concern (Rempel et al., 1985; Pennings and Wolensky, 1987). McAllister (1995) found that managers expressing high affect-based trust looked for more opportunities to meet their peers’ work-related needs and to engage in more productive intervention in task-related situations. Affect-based trust was found to have greater explanatory power than cognitive-based trust in explaining working behaviors. The informal relationship occurring between managers as a result of affect-based trust implies that any assessment of a peer’s trustworthiness must include a social perspective. McAllister (1995) further argues that once an evaluation of another manager is made, and that manager is viewed as high in affect-based trust,
such trust often continues even in the absence of its original cognitive basis (Zajone, 1980; Lewis and Wiegert, 1985). Working relationships in which affect-based trust exists are found to be more robust in nature than those based on a cognitive base, allowing for any conflict to be resolved satisfactorily for both parties (Johnson-George and Swap, 1982). Accordingly, it is hypothesized that:

H4c: Greater affect-based trust between functional managers will lead to increased perceived relationship effectiveness.

3. Research method

3.1. Sample and data collection

Two samples were collected. The first was collected from technically trained managers (i.e., R&D, engineering, and operations managers) in Australian firms, acting as key informants on their working relationship with a marketing manager during a NPD project in the previous three years (called sample 1). While the preferred method of data collection was to have matching dyads of managers, this became a “show-stopper” issue for the respondents and had to be ruled out as an option. Managers expressed great concern that the questionnaire would also be sent to their counterpart and stated outright that they would not be involved in the research if that was the case. Further probing found that the concept of trust was just too politically sensitive for them to feel comfortable reporting on for the sake of a survey. These concerns were also echoed by a significant number of managers whom contacted for inclusion in the study. Many noted ironclad assurances that their counterpart would not be approached and that they and their organizations would remain anonymous. Such sensitivity to being identified by the respondents suggested to us that had we proceeded with matched dyads there would have been two very detrimental outcomes for the research. First, the most significant was a definite risk of socially desirable reporting bias where the responses would be meaningless and, second, a much-reduced response rate from the population of interest. While there is a distinct possibility that many responses were matched dyads in our study as the respondents came from the same pool of companies, there is no way of proving so, and this is a limitation of the research.

The survey used a pretested, mailed, and self-administered questionnaire. The criteria used to qualify respondents were (1) the respondent’s firm needed to conduct NPD, and (2) the firm needed an identifiable manager responsible for R&D, and also an identifiable marketing manager or senior marketing executive. The sampling frame was generated from a commercial mailing list and screened to eliminate firms unlikely to be involved in NPD. The remaining firms were contacted by telephone, and those not involved in NPD were removed from the sampling frame. For sample 1, the methodology was repeated, and the survey was sent out to marketing managers.

3.1.1. Sample 1: technically trained managers (R&D managers, engineering and operations) as respondents

In total, 334 managers agreed to participate, and after two waves of follow-up phone calls, we received 184 usable responses, a net response rate of 54%. Of the 184 usable responses, 74 were from R&D managers (40.2%), 37 were from engineering managers (20.1%), 58 were from manufacturing managers (31.5%), and 15 were from other technically trained managers (8.2%). The sample of 184 firms comprised mostly goods producers (96.2%), while the remaining (3.8%) are software producers.

To ensure that the technically trained managers in different categories did not have any significant differences in their pattern of responses, a multivariate analysis of variance was performed for sample 1 across all of the key variables posited in the conceptual model. To test for type I error, the Bonferroni correction was applied at the conservative level of α = 0.5 (Tabachnick and Fidell, 1996). The results indicated that there were no statistically significant differences found between the groups. The results of this analysis support the decision to pool the respondent types into one data set for subsequent analysis.

3.1.2. Sample 2: marketing managers as respondents

In total, 294 marketing managers agreed to participate, and after three waves of follow-up phone calls, we received 145 usable responses, a net response rate of 49.3%. Of the 145 usable responses, typical respondent titles were 73 marketing manager (50.3%), 50 sales and marketing manager (34.5%), 6 sales managers (4.1%), and 16 (11.0%) in other category. The sample of 145 firms comprised mostly goods producers (95.8%), while the remaining (4.2%) are software producers. As in the case of sample 1, to ensure that the respondents did not have a significant difference in patterns of response, the Bonferroni correction was applied at the conservative level of α = 0.5 (Tabachnick and Fidell, 1996), with the results indicating that there were no statistically significant differences found between the groups.
In both samples, nonresponse bias and the pattern of early–late responses were examined to ensure the accuracy of the data collected (Armstrong and Overton, 1977). Nonresponse bias was addressed by contacting by telephone a random sample of 20 nonresponding managers to determine why they had not responded to the survey, e.g., interest in the subject matter, the sensitivity of the divulging their organizations’ NPD practices, its sensitivity in terms of their working relationship, and the format of the questionnaire. In all cases, the main factor preventing completion and return was that they were under heavy time constraints, and the questionnaire was sizeable in nature and would take a considerable amount of time for completion. In light of this and with a 54% response rate for study 1 and 49.3% for study 2, nonresponse bias is not considered a major problem affecting the generalizability of the research results.

Similarly, the examination of early versus late respondents was conducted for both studies by splitting the sample into the first 50 responses and the last 50 responses received and by comparing the means using analysis of variance on several descriptor variables, e.g., respondents time in position, the number of full-time company employees, and the core number of people involved in the NPD project. The analyses indicated that there were no statistically significant differences in the responses of early versus late respondents.

3.2. Measurement

Five existing reflective multi-item constructs were used to test our model: psychological distance, quality of communication, cognitive-based trust, affective-based trust, and perceived relationship effectiveness. The formative measure used was the new scale thought world developed for this study by examining the literature and by drawing from it items of relevance using the approach recommended by Diamantopoulos and Winklhofer (2001). Reliability analysis revealed that the composite reliability and alpha coefficients for all of the reflective scales exceeded 0.76, which is above the generally accepted benchmark of 0.70 (Nunnally, 1978). A full description of the final measures is contained in the Appendix. The associated statistics for both samples are shown in Table 1.

Two methods were used to establish convergent validity (1) examining the r-values of each item from the partial least squares (PLS) output, and all were statistically significant (Anderson and Gerbing, 1988), and (2) examining the average variance extracted (AVE) for each of the reflective constructs to ensure that they exceeded the generally accepted value of 0.50 (Fornell and Larcker, 1981). All measures exceed the 0.50 value for AVE. The issue of discriminant validity was established using two approaches, Fornell and Larcker’s (1981) and Chin’s (1998) approach. Importantly, as some of the variables are highly correlated (e.g., cognitive trust and affective trust), all construct cross-loadings were examined to ensure that no items loaded upon one another (Hair et al., 1998).

When interpreting the results in Table 2, please note that both thought world and psychological distance were measured in a manner where a higher value implied a smaller difference between the managers and hence H1 and H2 are expected to be positive.

3.3. Model testing

SmartPLS 2.0 (Ringle et al., 2005) was used to estimate our structural model. It was considered the most appropriate method for a number of reasons: (1) our primary concern is prediction of our endogenous variables (Chin, 1998; Diamantopoulos and Winklhofer, 2001; Fornell and Bookstein, 1982); (2) we use both formative and reflective measures; (3) in contrast to the use of well-developed and empirically validated measures in covariance structures such as LISREL (LISREL, LISREL Scientific Software International, Inc., Lincolnwood, IL) and EQS (EQS Science Plus Group, Gronigen, The Netherlands), which are predominantly used for theory testing, PLS allows the use of constructs that are lower in theoretical development in causal models without a great risk of model misspecification (Chin, 1998); (4) we do not make any assumptions about multivariate normality; and (5) our final sample sizes are not large (sample 1, n = 184 and sample 2, n = 145). Our parameter estimates and t-statistics were computed using 500 bootstrap samples.

4. Analysis and results

4.1. The effect of managerial differences – technically trained managers viewpoint

In our model, 10 of the 12 hypotheses were supported (see Table 2). H1a, thought worlds → quality of communication, where technically trained managers felt that their thought world differences were smaller with the marketing manager would lead to an increased quality of communication, was supported (β = 0.355, P < 0.001). H1b, thought worlds → cognitive-based trust, where technically trained managers felt that their thought world differences...
Table 1. Means, standard deviations, correlations, and internal consistencies of constructs

<table>
<thead>
<tr>
<th>Research and development/operations manager study</th>
<th>Internal consistency</th>
<th>Correlations of constructs</th>
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<tbody>
<tr>
<td></td>
<td>No. of items</td>
<td>Mean</td>
</tr>
<tr>
<td>Thought world differences</td>
<td>4</td>
<td>3.77</td>
</tr>
<tr>
<td>Psychological distance</td>
<td>3</td>
<td>4.17</td>
</tr>
<tr>
<td>Quality of communication</td>
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<td>4.65</td>
</tr>
<tr>
<td>Cognitive-based trust</td>
<td>5</td>
<td>5.19</td>
</tr>
<tr>
<td>Affect-based trust</td>
<td>5</td>
<td>4.83</td>
</tr>
<tr>
<td>Perceived relationship effectiveness</td>
<td>5</td>
<td>5.18</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Marketing manager study</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of items</td>
<td>Mean</td>
</tr>
<tr>
<td>Thought world differences</td>
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<td>4.09</td>
</tr>
<tr>
<td>Psychological distance</td>
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<td>4.45</td>
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<tr>
<td>Quality of communication</td>
<td>5</td>
<td>5.43</td>
</tr>
<tr>
<td>Cognitive-based trust</td>
<td>5</td>
<td>5.68</td>
</tr>
<tr>
<td>Affect-based trust</td>
<td>3</td>
<td>5.03</td>
</tr>
<tr>
<td>Perceived relationship effectiveness</td>
<td>5</td>
<td>5.42</td>
</tr>
</tbody>
</table>

Note: 1. Means, standard deviations, correlations, and internal consistencies of constructs.
2. Denotes a formative measure.
3. ABT: affect-based trust; CBT: cognitive based trust; n.a.: not applicable; PRE: perceived relationship effectiveness.
were smaller with the marketing manager would lead to increased cognitive-based trust, was surprisingly not supported (β = 0.077, P > 0.05). H1c, thought worlds → affective-based trust, where technically trained managers felt that their thought world differences were smaller with the marketing manager would lead to increased affective-based trust, was supported (β = 0.167, P < 0.01). H1d, thought worlds → perceived relationship effectiveness, was not supported (β = 0.091, P > 0.05), indicating no direct effect.

The hypotheses relating to the effects of smaller psychological distance on technically trained managers perceptions of their marketing counterpart were: H2a psychological distance → quality of communication was supported (β = 0.320, P < 0.001); H2b psychological distance → cognitive-based trust was also supported (β = 0.177, P < 0.01); H3b was not supported, psychological distance → perceived relationship effectiveness (β = 0.001, P > 0.05).

As predicted, when technically trained managers perceived high quality of communication on projects, it had strong positive effect on cognitive trust and perceived relationship effectiveness; H3a quality of communication → cognitive-based trust (β = 0.560, P < 0.001) and H3b quality of communication → perceived relationship effectiveness (β = 0.228, P < 0.001) were both supported.

For technically trained managers, both forms of trust had strong positive effects on perceived relationship effectiveness with the marketing manager. H4a cognitive-based trust → perceived relationship effectiveness (β = 0.335, P < 0.001) was supported, as was H4b affective-based trust → perceived relationship effectiveness (β = 0.328, P < 0.001). As expected, H4b affective-based trust → affective-based trust was also supported (β = 0.623, P < 0.001).

4.2. The effect of managerial differences – marketing manager viewpoint

In our model, 8 of the 12 hypotheses were supported. Where marketing managers felt that their thought world differences were smaller with the technically trained managers, it would lead to an increased quality of communication; H1a, thought worlds
quality of communication was supported with strong positive effect ($\beta = 0.391, P < 0.001$). Where marketing managers felt that their thought world differences were smaller with the technically trained managers and would lead to increased cognitive-based trust, H1b thought worlds $\rightarrow$ cognition-based trust was supported ($\beta = 0.165, P < 0.01$). This was different to the technically trained manager finding, H1c, thought worlds $\rightarrow$ affective-based trust, where marketing managers felt that their thought world differences were smaller with the technically trained manager and would lead to increased affective based trust, was strongly supported ($\beta = 0.311, P < 0.001$). H1d, thought worlds $\rightarrow$ perceived relationship effectiveness, was not supported ($\beta = 0.022, P > 0.05$), indicating no direct effect.

The hypotheses relating to the effects of smaller psychological distance with perceptions of their technically trained manager counterparts were all refuted: H2a psychological distance $\rightarrow$ quality of communication ($\beta = -0.165, P > 0.05$), H2b psychological distance $\rightarrow$ cognitive-based trust ($\beta = -0.009, P > 0.05$), H3b psychological distance $\rightarrow$ perceived relationship effectiveness ($\beta = -0.010, P > 0.05$).

As predicted, and similar to the perceptions of their technically trained manager counterparts, when marketing managers perceived high quality of communication on projects, it had strong positive effects on cognitive trust and perceived relationship effectiveness; H3a quality of communication $\rightarrow$ cognitive-based trust ($\beta = 0.602, P < 0.001$) and H3b quality of communication $\rightarrow$ perceived relationship effectiveness ($\beta = 0.276, P < 0.001$) were both supported.

For the marketing manager, both forms of trust had strong positive effects on perceived relationship effectiveness with the technically trained manager. H4a cognitive-based trust $\rightarrow$ perceived relationship effectiveness ($\beta = 0.566, P < 0.001$) was supported, as was H4c affective-based trust $\rightarrow$ perceived relationship effectiveness ($\beta = 0.297, P < 0.001$). As expected, H4b cognitive-based trust $\rightarrow$ affective-based trust was also supported ($\beta = 0.521, P < 0.001$).

5. Discussion and managerial implications

In this paper, we examined the effects of managerial differences on communication, interpersonal trust (cognitive and affective) and its effect on perceived relationship effectiveness. Our findings add further empirical support for the proposition that trust does matter in effective managerial-level working relationships (McAllister, 1995; Massey and Dawes, 2007). Importantly, the results suggest that the relationship between marketing managers and their technical counterparts is far healthier and more robust than previously thought (Souder, 1981, 1988; Shaw and Shaw, 1998).

Both forms of trust had strong positive effects on perceived relationship effectiveness, indicating that working relationships are not merely 'transaction based' where one function transfers information to another discipline. The existence of both forms of trust indicates that the working relationship is far more complex than an information processing one based primarily on a cognitive base. The existence of affective trust in the relationship indicates that functional managers derive more from the relationship than information alone (e.g., mutual support, a sense of team, and the enjoyment of social interaction), which are possible benefits in a work environment that can be full of uncertainty and risk. This finding is in accordance with Jones and George (1998), who studied teamwork and found that having a positive mood and degree of 'affect' in the relationship had benefits on several social processes such as greater citizen behavior, better communal relations, high confidence in others, help-seeking behavior, free exchange of knowledge and information, subjugation of personal needs and ego for the greater common good, and high involvement in processes.

Having used trust as the theoretical base for examining the managerial-level working relationship, we examined two psychological antecedent variables that where thought to heavily influence the way functional managers perceived each other, thought worlds and psychological distance. Interestingly, there were functional differences in relation to the effects of thought worlds. Supporting the argument that closing thought world differences is beneficial is our finding that quality of communication was higher when the differences were small in thought worlds (Dougherty, 1992). However, the finding that for technically trained managers, thought world differences had no significant effect on cognitive trust was unanticipated as a perpetual complaint in the NPD literature has been that marketing do not have an appreciation of the technically trained perspective on NPD (Ancona and Caldwell, 1992; Shaw and Shaw, 1998). A possible explanation may be that while smaller thought world differences help in terms of quality of communication as they build an understanding of each others jargons, technically trained managers need evidence of ability before cognitive trust develops. Our examination of the role of thought worlds on affective trust was exploratory in nature, and our results indicated that smaller thought world
differences had a positive effect on affect-based trust for both marketing managers and their technical counterparts adding weight to the argument that ‘similarity attracts’ (Milliken and Martins, 1996).

In terms of the second antecedent variable, psychological distance, technically trained managers value similarities in decision-making styles. This is not surprising as they are technically trained and more analytical in their approach to problem solving (Wheelwright and Clark, 1992). In contrast, psychological distance was not an issue that troubles marketing managers. A possible reason for this is that marketing managers by their training and disposition may be more inclined to the softer, more intuitive approaches to problem solving.

As expected, quality of communication had strong effects on cognitive-based trust and relationship effectiveness for all functional managers as the purpose of cross-functional work is to solve problems with effective information transfer. The quality of communication did have a significantly stronger effect on cognitive trust than perceived relationship effectiveness indicating that it is through trust development that quality of communication can be more beneficial for working relationships.

5.1. Managerial Implications

For top management seeking to integrate functions, a useful starting point would be at the functional manager level. Rather than an over-reliance on highly formalized NPD processes, e.g., stage gate and third-generation processes (Cooper, 1994; Barrack et al., 2009), quality functional development (QFD) (Griffin, 1992b), to ensure that functional interaction occurs, top management should try to eliminate the structural, reward-based, and resource-related rivalries that prevent successful integration and allow trust-based relationships to grow (Griffin and Hauser, 1996; Song et al., 1996; Mahtz et al., 2001). Our reasoning is that while having formalized processes have been found useful in increasing formal and informal communication (Moenena et al., 1994) and in ensuring a minimum level of communication and cooperation (Ruekert and Walker, 1987; Ayers et al., 1997), several authors warn that they do have negative aspects for NPD work. O’Leary-Kelly and Flores (2002) caution against the added costs associated with the structural and infrastructure mechanisms necessary for high levels of integration. Gruenwald (1997) argues that overly formalized systems lead to slower reaction times to unanticipated problems, slow product development, and time-to-market delays. Also, Kahn and Mentzer (1998) found that highly formalized processes inhibited functional interaction and communication.

Overcoming barriers to interpersonal trust should be the priority of top management. Unfortunately, merely telling people to trust one another is not likely to achieve anything except generate cynicism and lose top management considerable credibility. We suggest developing techniques that fast track the acquisition of much of the data (cognitive and affective) that traditional integration mechanisms provide managers for minimizing thought world differences (e.g., liaison officers, co-location and personnel movement opportunities, and face-to-face communication, including Skype). For example, in new work situations (e.g., cross-functional teams, NPD committees, and a newly appointed manager), formalized ‘discovery’ processes should be followed to introduce people to one another in the way a job interview would be conducted. Questions that inform cognitive trust, such as previous work experience, specific NPD project experience, participant’s relative NPD strengths and weaknesses are a useful start. Further questions regarding their personal decision-making process and style, their information needs for the project and preferred information format and delivery mode would all be beneficial in establishing a cognitive base to the relationship. Similarly, the use of affective trust-based questions, interests, sports, hobbies, and family can be introduced. This would assist in moving new relationships through what Hutt (1995) calls the ‘exploration stage’ to the ‘testing stage’ of development. The exploration stage is characterized by each manager attempting to ‘search out important expectations and assumptions, as well as assess the strengths and limitations of each other. Trust or mistrust begins to develop as each other evaluates the judgment, integrity, motives, and consistency of the actions of the counterpart’ (p. 353). As NPD projects progress, the testing and negotiation of important expectations occur, and the bases and limits of trust are clarified with important differences confronted and resolved by mutual accommodation, compromise, or creative resolution. We suggest that progressing relationships along Hutt’s relationship continuum (exploration – testing – stabilization) will be faster and smoother if both bases of trust are actively engaged by utilizing a formalized discovery process. Particularly important is that if relationships start with an affective component and are not just based on cognitive factors (e.g., reports, information transfer), any challenge or tests to expectations are more likely to be resolved in a positive manner (Dirks and Ferrin, 2001).
According to our results, such a 'discovery' process will have different effects based on functional orientation. Technically trained managers are primarily interested in the decision-making style of their marketing counterpart and whether or not they can provide the necessary task-related information for problem solving. In contrast, marketing managers want technically trained managers to come into their thought worlds and appreciate the customer and competitive pressures and fast-paced nature of their work.

Finally, even though the prevailing view within the literature seems to be that marketers have fundamental differences with their technical counterparts inhibiting their working relationships, the actual working relationship is trusting and relatively healthy between functional managers. While closing thought world gaps is beneficial, a generic approach is not the most efficient way to do so. Tailoring any approach to take in the functional perspectives highlighted here would be the optimum approach (i.e., appreciating that decision-making styles and processes are more important for technically trained and that closing thought worlds for marketers is very beneficial).

6. Limitations and future research directions

A number of limitations are acknowledged in this research. First, the findings here are not based on matched dyads. During the qualitative interviews, the functional managers made it very clear that they would either not participate in the survey or not answer honestly if their counterpart was asked to do so. While both respondents were from the same pool of NPD active companies and may have indeed reported on each other, there is no way of knowing as their anonymity was respected. Second, the study was cross-sectional in nature, taking a single snapshot back in time and is therefore a 'static' study and may not have captured the iterative and dynamic processes of trust and relationship formation. In the future, longitudinal data could be used to examine the development or maintenance of trust, thus better establishing internal validity. As the topic of trust is still an under-researched area in the field of NPD studies, there are several interesting and potentially fruitful areas arising from this study. One of these is the managerial challenge of creating a means of coordination that permits both effective specialization and coordination, and facilitates the development of a trusting climate within the NPD process.

References


Communication, trust, and relationship effectiveness

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### Appendix. Operational measures

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>Adapted from</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thought worlds</td>
<td>Seven-point scale anchored by 1 'Completely Disagree' and 7 'Completely Agree'. The Marketing Manager and I are similar in terms of: (1) Our general work experience; (2) Our understanding of our customers; (3) Our understanding of technical matters; (4) Our understanding of marketing matters</td>
<td>New formative scale</td>
</tr>
<tr>
<td>Psychological distance</td>
<td>Seven-point scale anchored by 1 'Completely Disagree' and 7 'Completely Agree'. The Marketing Manager and I are similar in terms of: (1) The time it takes to make a decision; (2) Our tolerance for risk; (3) Our belief that there is always a <code>right</code> answer; (4) Our personal style of conflict resolution; (5) The amount and type of information that is required before we make decisions about our products</td>
<td>Fisher et al. (1997)</td>
</tr>
<tr>
<td>Quality of communication</td>
<td>Seven-point scale anchored: 1 'Completely Disagree' and 7 'Completely Agree'. (1) The information provided by the MM was very useful for my work on this project; (2) I was very satisfied with the content of the information provided by the MM on this project; (3) The information provided by the MM was highly relevant to my work on this project; (4) The information provided by the MM was highly credible; (5) The form and presentation of the information provided by the MM was very satisfactory</td>
<td>Moen and Moen (1992)</td>
</tr>
<tr>
<td>Cognition-based trust</td>
<td>Seven-point scale anchored: 1 'Completely Disagree' and 7 'Completely Agree'. (1) Most people, even those who aren't close friends of the MM, trust and respect him/her as a fellow worker; (2) He/she approaches his/her job with professionalism and dedication; (3) Given his/her track record, I see no reason to doubt his/her competence and preparation for the job; (4) I can rely on him/her to not make my job more difficult by careless work; (5) Other work associates of mine who must interact with him/her, consider him/her to be trustworthy.</td>
<td>McAllister (1995)</td>
</tr>
<tr>
<td>Affect-based trust</td>
<td>Seven-point scale anchored: 1 'Completely Disagree' and 7 'Completely Agree'. (1) Ours is a relationship in which we both freely share our ideas, feelings, and hopes; (2) I can talk openly to him/her about difficulties that I'm having at work and know he/she will want to listen; (3) If I shared my problems with him/her, I know that he/she would respond constructively and with understanding.</td>
<td>McAllister (1995)</td>
</tr>
<tr>
<td>Perceived relationship effectiveness</td>
<td>Seven-point scale anchored by 1 'Completely Disagree' and 7 'Completely Agree'. (1) Throughout this project, I was very satisfied with our working relationship; (2) During this project, the MM fully carried out his/her responsibilities and commitments to me; (3) I think the time and effort that I spent developing and maintaining this working relationship was very worthwhile; (4) During this project, the MM responded well to feedback and advice from myself; (5) Overall, our working relationship was very successful.</td>
<td>Ruckert and Walker (1987)</td>
</tr>
</tbody>
</table>

*1 Item deleted following partial least squares analysis.  
2 Item deleted on face validity grounds.