Journal of the Academy of Marketing Science (2019) 47:795–814
https://doi.org/10.1007/s11747-019-00656-8

ORIGINAL EMPIRICAL RESEARCH

How intrafirm intermediary salespeople connect sales to marketing and product development

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Received: 19 October 2017 / Accepted: 22 April 2019 / Published online: 8 June 2019

Abstract

This research reveals the ways that salespeople manage intrafirm relationships by acting as intermediaries, connecting intrafirm members that would otherwise be unconnected. Using a two-study, multimethod design, the authors establish that (1) salespeople act as representative intermediaries positioned between peers in sales and those in marketing and product development; (2) the effects of representative positions with marketing and product development on performance are non-linear; and (3) selling-related knowledge moderates representative effects on performance. Representative salespeople act as the exclusive connection between a peer salesperson and a non-sales contact (marketing or product development), controlling non-redundant knowledge to gain influence over their peers. This research contributes to marketing by identifying non-linear effects for how salespeople mediate relationships between their peers and others in key intrafirm functions, and showing that salespeople with high selling-related knowledge realize enhanced effects of the representative position on sales performance.

Keywords Intrafirm network intermediary · Intrafirm relationships · Network theory · Selling-related knowledge · Salesperson performance

As the role of salespeople continues to evolve in a solutions context, cross-functional interdependence and the management of intrafirm relationships is growing in importance. For example, top-performing salespeople are three times as likely to interact with multiple groups inside their firm (Kovac and Frick 2017), and cross-functional cooperation can improve sales performance by 25% (Jansen 2017). Performance effects of salesperson involvement in solution selling are enhanced in firms with greater sales unit cross-functional cooperation (Panagopoulous, Rapp, and Ogilvie 2017). Research suggests that salespeople gain information and resource advantages when they connect with a more diverse set of intrafirm members, helping them serve as invaluable sources of information for peers seeking to improve their performance (Claro and Kamakura 2017; Steward et al. 2010). For example, a salesperson who works with others in marketing and product development throughout the solution selling process gains knowledge about markets, brand communication, and products that drives sales performance and can be shared with peers. While salespeople are critical sources of information from whom peers can learn, the ways in which salespeople do so to gain advantages to improve their own performance have not been identified (Chan et al. 2014; Ernst et al. 2010). In this research, we address the question of how salespeople increase their sales performance by acting as the exclusive connection between a peer salesperson and a non-sales contact, controlling non-redundant knowledge to leverage influence over their peers.

We address this question by identifying how salespeople act as intrafirm intermediaries or position themselves among marketing and product development members and peer salespeople. Understanding how salespeople act as intermediaries is important for two reasons: (1) intermediary salespeople connect peer salespeople to valuable non-sales contacts who

Shrihari Sridhar served as Area Editor for this article.

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s11747-019-00656-8) contains supplementary material, which is available to authorized users.

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would otherwise go unconnected, and (2) intermediary salespeople transfer non-sales knowledge in a way that makes them more influential in their firm. We adopt a social network perspective of intermediaries that is centered on the effects of salespeople who position themselves as *representatives* in the intrafirm network by connecting a peer salesperson and an individual in marketing or product development that would otherwise be unconnected (Gould and Fernandez 1989). The representative salesperson gains influence via control over the ways that information acquired from a contact in a non-sales function is exchanged with peer salespeople.

Thus, this research seeks to achieve two objectives. First, we seek to understand the ways in which occupying a representative position impacts salesperson performance, exploring differences in the representative position with marketing and product development. Second, we aim to understand how these effects might be moderated. Specifically, we explore the impact of selling-related knowledge (SRK) on the relationship between the representative position and sales performance. SRK represents knowledge that salespeople use for selling solutions to customers and is the basis of a salesperson's solution-selling skills, helping them perform their role and manage uncertainty in the solution selling process (Ulaga and Kohli 2018; Verbeke et al. 2011). We expect SRK to moderate a representative salesperson's ability to transfer knowledge to their peers and increase their influence.

We use a two-study, multi-method approach to achieve these objectives. Figure 1 depicts our research approach and conceptual framework. In Study 1, we conduct depth interviews with 57 salespeople to gain a rich understanding of the knowledge structures that distinguish salesperson performance and explore the pattern of interpersonal relationship ties that salespeople maintain inside their firm. In Study 2, we collect network data and test the conceptual framework in a field study with 203 salespeople from a global business services provider. Our network analysis uses a combination of survey data and objective annual sales data to reveal a consistent pattern of effects that links the representative position and SRK to salesperson performance, which lends support to our model.

Exploring the different ways in which occupying a representative position impacts salesperson performance, we make three contributions to marketing research centered on how salespeople benefit from intrafirm relationships (Bolander et al. 2015; Gonzalez et al. 2014; Plouffe et al. 2016). Interestingly, we uncover differential and counter-intuitive effects for the representative position. First, there are diminishing returns (non-linear effects) to the representative position with marketing. The impact of the influence that representative salespeople can leverage diminishes as they try to intermediate too many relationships, and they reach their capacity to pay attention to those seeking their advice and cannot dedicate the same amount of effort to transfer knowledge to peers. Second, we establish a contrasting non-linear effect of the representative position with product development on salesperson performance. Those who intermediate too few relationships realize detrimental effects on performance. By intermediating a larger number of relationships, they have more opportunities to transfer knowledge in order to effectively translate meanings and negotiate interests across product development and sales. This sheds new light on the ways in which sales–product development knowledge exchange impacts salesperson performance in a solution-selling context (Homburg et al. 2017).

Our study is the first, to reveal that the pattern of effects of being an intrafirm intermediary can differ based on the type of relationships involved. With one type of relationship (marketing), salespeople must manage not being an intermediary too many times, and with another (product development), they must manage not being an intermediary too few times. A post hoc marginal effects analysis of the optimal balance of taking

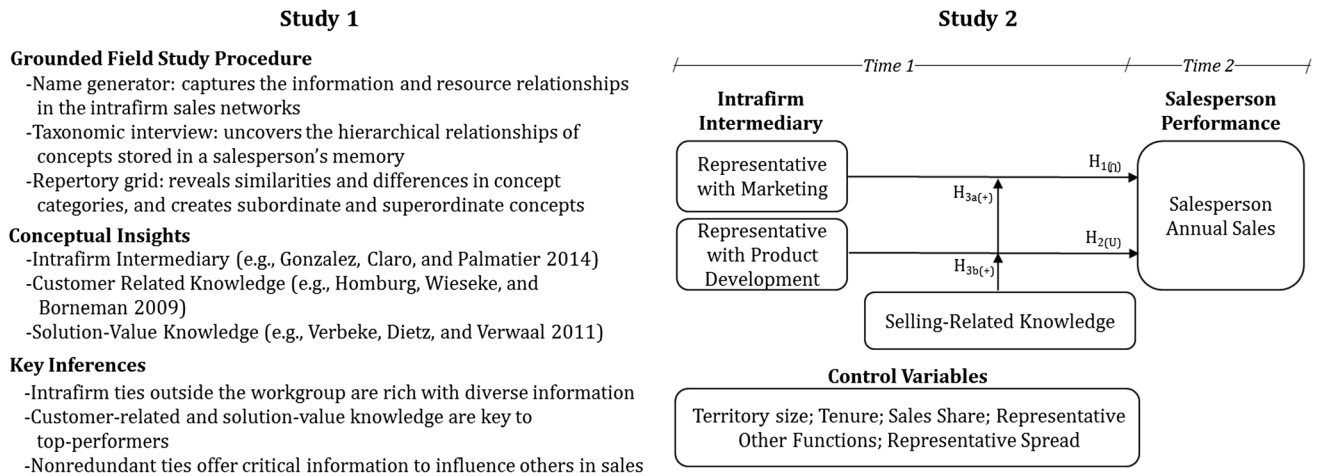

Fig. 1 Research approach

too many or too few representative positions in marketing and product development revealed that the vast majority of salespeople in our sample either overinvested or underinvested. For example, 89% of salespeople in our sample were overinvesting in representative positions with marketing, and would optimize their performance by maintaining fewer.

Third, we identify the ways in which SRK enhances the effects of the representative position on performance, further refining our understanding of how acting as an intermediary benefits a salesperson, and contributing to the literature on salesperson knowledge (e.g., Homburg et al. 2009; Menguc et al. 2013). We find that SRK enhances the non-linear relationship between the product development representative position and performance, those with greater SRK experienced the positive effects of a larger number of relationships as a representative with product development, while those low in SRK did not. This supports our argument that SRK, developed by salespeople to derive value from relationships with customers, also serves to accentuate influence in relationships with intrafirm members.

Literature review

Salesperson as intrafirm intermediary

Research in marketing recognizes that individual salesperson success is dependent on how well salespeople place themselves among members of their organizations (see Table 1). This is increasingly important as salespeople become more involved in solution selling processes. Solutions can be viewed as a set of buyer–seller relational processes comprised of activities that are carried out by individuals in multiple functional units (Tuli et al. 2007). Salesperson involvement in solution processes includes the delivery of novel solution configurations by uncovering customer requirements, combining goods and services from their firm's portfolio of offerings, and integrating products with valuable resources and technical expertise (Panagopoulos et al. 2017). Salesperson intrafirm relationships have been proposed to be especially critical for the creation of solutions, linking a diverse range of experts and leveraging firm resources on behalf of customers (Üstüner and Godes 2006). Salespeople who are able to direct or coordinate the connections between intrafirm members more effectively recruit and deploy firm expertise (Steward et al. 2010). The positive effects of salesperson involvement in solution selling processes are enhanced when their firm has greater levels of sales unit cross-functional cooperation (Panagopoulos et al. 2017), suggesting that salespeople can act as a link between peer salespeople and those in non-sales functions.

Social network theory provides a powerful lens through which to study the salesperson-as-intermediary intrafirm role. This research shows that brokerage is important for individual performance as it provides access to and control over non-redundant information resulting in influence over co-workers (Burt 2005). This is a result of brokers or intermediaries standing between otherwise unconnected firm members (Burt 1992; Gould and Fernandez 1989). As depicted in Table 1, marketing has drawn from this theory base to understand how salespeople position themselves to impose influence and drive individual performance. Being highly central in the firm and connected to more powerful members endows a salesperson with reputational resources such as status, resulting in influence (Bolander et al. 2015). In addition, connecting otherwise unconnected individuals in formal and informal intrafirm networks offers control in multiple contexts over information and influence needed to enhance performance (Gonzalez et al. 2014). Many internal relationships with individuals in multiple intrafirm groups help salespeople coordinate intrafirm expertise, which impacts salesperson performance (Steward et al. 2010). What this body of research lacks is an investigation into how salespeople position themselves between those in sales and intrafirm members in other knowledge or functional domains to gain influence and enhance performance.

In our research, we leverage the social network literature to explore the impact of a salesperson occupying a key intrafirm intermediary role between peer salespeople and non-sales intrafirm members—the representative position. Being an intermediary or standing between unconnected others has been approached in several different ways in the network literature, including betweenness centrality and structural holes (Brass et al. 2004; Burt 1992). The representative position offers key advantages compared to these other approaches. First, it explicitly considers the directions in which information flows. Salespeople in the representative position actively and purposively *acquire* information through ties within functions other than sales and *provide* information to peers who seek them out. For example, in Fig. 2, Tom, who is in a representative position, seeks out and acquires information from individuals in marketing and product development. Then, when Sue seeks out Tom for information, he can provide information he gained from both or one of the individuals. The representative (Tom) acts as a broker on behalf of his peer (Sue). Next, the representative position involves only a single intermediary, unlike betweenness centrality, which can involve long chains of intermediaries (Wasserman and Faust 1994). By accounting for only direct relationships, this position more explicitly isolates the occurrence of unconnected others or brokerage via exclusive relationships between contacts (Gould and Fernandez 1989).

Intrafirm role of selling-related knowledge (SRK)

Knowledge and skill are fundamental constructs that marketing scholars study in order to better understand salesperson

Table 1 Selected relevant literature on salesperson intermediary and selling-related knowledge

Reference	Area of Focus	Research Setting	Salesperson Intermediary Concepts	Selling-Related Knowledge Concepts	Key Findings
Bolander et al. (2015)	Salesperson intrafirm social network effects	Field survey of 286 salespeople in a B2C firm	Positional centrality	N.A.	Being positioned centrally in the intrafirm network drives salesperson performance because of an information advantage gained from access to unique information and resources.
Gonzalez et al. (2014)	Relationship manager intrafirm network effects	Field survey of 101 relationshp managers in a B2B firm	Brokerage in formal and informal networks	N.A.	RMs positioned as brokers in intrafirm formal and informal networks gain access to and control over non-redundant information that can be combined with benefits gained from dense networks to improve performance.
Hall et al. (2015)	Salesperson-customer interactions	Field study of 48 salespeople in 330 customer - salesperson dyads in a B2C retailer	N.A.	Accurate customer intuition	Salespeople who accurately make intuitive judgements about customer needs, through pattern recognition from knowledge in memory, realize greater selling effectiveness, purchase, and purchase amount.
Homburg et al. (2009)	Salesperson-customer interactions	Two field studies with 215 and 237 salespeople in travel agencies	N.A.	Customer need knowledge	Salespeople who possess more accurate knowledge of customers' hierarchy of buying needs realize greater customer satisfaction and customer willingnesss to pay.
Lam et al. (2010)	Market orientation intrafirm diffusion	Field surveys of 43 sales directors, 285 sales managers, and 1528 salespeople in a B2B *Fortune* 500 firm	Individual market orientation	N.A.	Expert peer salespeople are important intermediaries that transfer top manager and middle manager individual market orientation to peer salespeople.
Leigh et al. (2014)	Telephone and person-to-person sales calls	Field study of 150 insurance agents using free elicitation interviews	N.A.	If-then procedural contingency knowledge	High-performing salespeople are more likely to structure knowledge in memory of customer activities or events by centering on customer contingencies and task-specific adaptivity, creating if-then procedural contingencies.
Mullins et al. (2014)	Salesperson-customer dyadic relationship	Field surveys of 132 matched salesperson - customer dyads in B2B *Fortune* 1000 firm	N.A.	Salesperson percetual accuracy of relationship quality	Accurate salesperson perceptions of relationship quality result in increasingly more profitable customers, while inaccurate perceptions of relationship quality result in lower profits due to relationship overinvestment or revenue loss.
Plouffe et al. 2016	Strategic frontline employee (SFLE) influence effectiveness	Field survey of 271 salespeople in 2 B2B firms	Stakehoder groups: internal, external, and customer	N.A.	SFLEs connect multiple stakeholder groups, and their ability to influence intrafirm business team behavior has a greater impact on sales performance than influence efforts aimed at customers or external business partners.
Steward et al. (2010)	Salesperson intrafirm expertise coordination	Two-phase field depth interviews of 60 salespeople and 17 managers in B2B *Fortune* 100 firm	Relationship diversity	N.A.	More diverse intrafirm relationships provide access to more unique skills and knowledge and improve a salesperson's ability to coordinate the expertise of disparate firm actors.
Verbeke et al. (2011)	Meta-analysis of salesperson performance	Meta-analysis of 268 studies on salesperson performance	N.A.	Selling-related knowledge	Salespeople with greater selling-related knowledge, both quantity and richness of knowledge used to

Table 1 (continued)

Reference	Area of Focus	Research Setting	Salesperson Intermediary Concepts	Selling-Related Knowledge Concepts	Key Findings
					sell products and services, achieve greater sales performance.
This Study	Salesperson intrafirm social network effects	Study one: qualitative interviews of 57 B2B salespeople. Study two: field survey of 203 B2B salespeople.	Intrafirm representative position	Selling-related knowledge	High-performing salespeople are intrafirm representatives between the salesforce and outside business functions. Selling-related knolwedge comprises customer-need and solution-value knowledge, and combines with being intermediary representative to enhance performance.

performance (Weitz and Bradford 1999). Research recognizes that knowledge-based competencies play an increasingly important role in salesperson performance as the management of customer relationships grows more and more embedded in knowledge economies and evolves toward customized solution development (Table 1). Scholars also recognize that knowledge and skill are so closely related that they are indicative of each other (Cohen and Levinthal 1990). A recent review of sales performance drivers found that selling skill level has the most significant impact on performance (Verbeke et al. 2011). Selling skill is a salesperson's level of SRK, a combination of technical skills (i.e., knowledge of product features and customers) and customer problem-solving skills (i.e., knowledge used to generate solutions that create value for customers). Selling skill is the foundation of solution selling competency or value creation know-how which includes: uncovering customer needs/objectives, mobilizing intrafirm members/resources, customizing goods/services, and managing key contacts within the customer firm (Ulaga and Reinartz 2011).

Table 1 presents selected marketing research on SRK, which reveals that superior knowledge endows the salesperson with greater skill in recognizing customer needs and generating value from customer relationships. An ability to more accurately assess customer needs improves customer satisfaction and creates a greater willingness on the customer's part to pay for the service provided (Homburg et al. 2009). Salespeople who possess a more accurate understanding of the quality of the firm's relationship with a customer engage in more appropriate relationship-building activities and generate greater profit from their relationships with customers (Mullins et al. 2014). More exact knowledge about customer needs also grants salespeople greater intuition that improves their decision-making efforts and speed (Hall et al. 2015). More inferential "if-then" knowledge allows high performers to more effectively adapt selling activities or to sequence events in ways that are more relevant and central to enhancing relationships with customers (Leigh et al. 2014). Based on this, we conceptualize and operationalize SRK in our study to comprise customer-related and solution-value knowledge.

Scholars producing this body of research have rightfully focused on the effects of SRK on interfirm relationships—specifically, salespeople's relationships with customers (e.g., Homburg et al. 2009). However, emerging research suggests that SRK can enhance a salesperson's influence among the set of intrafirm ties on whom they rely to help them better serve customers. For instance, salespeople who actively exchange customer-related knowledge and share access to customers with members in their firm's product development function can influence product modifications to directly benefit their customers (Joshi 2010). Additionally, salespeople create influence among a set of intrafirm ties by positioning themselves as thought leaders willing to exchange their expertise in

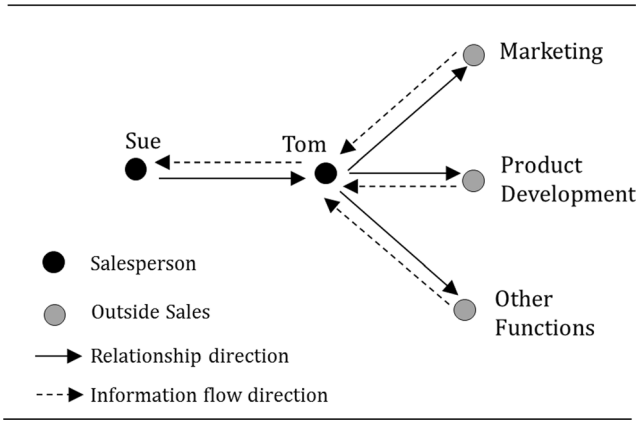

Fig. 2 Illustration of representative position

providing solutions to customers for resources that support their customer-directed selling efforts (Plouffe et al. 2010; Verbeke et al. 2011).

Our research seeks to shed light on the ways in which SRK influences the advantages a salesperson gains when he or she acts as an intrafirm intermediary. Specifically, we center on knowledge that drives a salesperson's skill for recognizing customer needs and developing the activities necessary for extracting value from relationships. This knowledge comprises: (1) customer-related knowledge (i.e., organized, structured, beliefs and understanding about different types of customers) and (2) solution-value knowledge (i.e., knowledge that links key solution elements to the firm's financial objectives). SRK comprises the foundation from which salespeople develop the solution-selling skills needed to build value through relationships with customers. Thus, it should also help them more effectively leverage their relationships with those inside their firm from whom they acquire and with whom they share resources.

Study 1: Exploring the intermediary position

Study 1 pursues two specific objectives. First, it identifies the impact that key intrafirm relational ties maintained by salespeople have on performance. Second, it explores the ways in which SRK may differentiate salesperson performance. We are especially interested in the way salespeople place themselves in the "middle of things" by forming ties with non-salespeople in their firm. To ensure the appropriate context, we collected data from a firm that employs salespeople who (1) are each responsible for a sizeable portfolio of customer accounts, (2) depend on intrafirm members to serve their accounts effectively, and (3) vary significantly in terms of their performance level. The firm is a *Fortune* 500 B2B global transportation and logistics services provider whose salespeople serve small and medium-sized business accounts. To maximize their performance, they rely on intrafirm members to efficiently manage accounts and deliver customer solutions that include specialized services, flexible pricing, and customized delivery.

Sample

Triangulating across three independent sources of objective and subjective data, managers in the firm identified a representative group of salespeople based on their performance. First, after averaging three years of revenue and profit performance, the firm sorted the salespeople into three groups depending on whether they consistently exceeded profit and revenue goals (high performers), met target goals (average performers), or consistently failed to meet revenue and profit targets (low performers). Performance reflected the actual revenue or profit generated by a salesperson in a given year as a proportion of the revenue or profit goal established for that salesperson in the same year. Second, the immediate managers used their subjective evaluations of salesperson performance to fine-tune the initial groupings. Third, the vice president of sales verified the accuracy of each salesperson classification. The final sample generated by the firm consisted of 19 high performers, 19 average performers, and 19 low performers.

Interview protocol

We used structured interviews to elicit information about the 57 participant salespeople's SRK and intrafirm relationships (see the Web Appendix for more details on the data collection and analysis procedure). To capture intrafirm relational ties, participants were asked to identify individuals "within your own company whom you rely on for information about your customers and the sales strategies that you use." The name-generating procedure established by Podolny and Baron (1997) identifies the intrafirm networks established by individuals, and has been used in marketing studies centered on salesperson intrafirm networks (e.g., Bolander et al. 2015; Gonzalez et al. 2014). The names and job titles for each named contact were recorded and cross-referenced with the firm's records.

To uncover the structure as well as the content of a salesperson's SRK, we combined elements of the taxonomic interview procedure (e.g., Hodgkinson and Johnson 1994; Porac et al. 1989) with the repertory grid technique (Fransella et al. 2004). These methods reveal the organizational system by which knowledge concepts are related to each other in terms of their level of abstraction (Rosch 1978); as illustrated in the Web Appendix, more abstract concepts (e.g., corporate accounts) subsume less abstract sub-concepts (e.g., high-profit accounts, specialty markets).

Participants were asked to consider their account list and group their customers based on similarities and differences using attributes they found helpful in performing their role as a salesperson (Hodgkinson and Johnson 1994). Once the

initial customer categories were established, participants were asked to provide a label for each category that captured its central tendencies and to detail the characteristics they would use to describe the categories (see the Web Appendix for an illustrative map of a salesperson's knowledge structure). Focusing on the initial set of customer categories, participants were asked to compare each category dyad and identify similarities and differences until all relevant distinctions had been revealed. This helped participants further activate subordinate and superordinate concepts and specify category meanings in more detail (Barsalou and Ross 1986). This process continued until all category dyads had been compared and the salesperson felt satisfied that all customer concepts had been identified. Consistent with Hodgkinson and Johnson (1994) and Porac et al. (1989), the resulting hierarchical maps were recorded as the interview unfolded so that the salesperson could validate and modify their responses during the session. The interviews were recorded and transcribed with the permission of the participant.

Data analysis

Following a grounded theory approach (Glaser and Strauss 1967; Steward et al. 2010), we identified the knowledge concepts that distinguish high- versus low-performing salespeople. The data were coded in three phases. First, a pilot study was conducted with 5 salespeople in the firm in order to learn industry terminology, identify the role of the salesperson in the firm, and refine the interview protocol. Second, using open coding and initial understandings from the pilot study, two judges worked independently to generate a coding dictionary and coded a subset of the transcripts, and then refined the definitions of the constructs in the coding dictionary. Next, the judges completed the coding of the transcripts and identified 224 unique concepts across the maps of all salespeople. Last, using theoretical coding and a review of the literature, the judges recorded two dimensions of SRK: (1) customer-related knowledge and (2) solution-value knowledge. The intercoder reliability index was .88 (I_r) for customer-related knowledge and .92 (I_r) for solution-value knowledge. These numbers exceed the established benchmarks (Perreault and Leigh 1989). Additional details of the coding and analysis process used to identify the knowledge constructs can be found in the Web Appendix.

Results

First, we present the results from the analysis of salesperson intrafirm relationship formation. The results support the view of high-performing salespeople as intrafirm intermediaries. Then, we present the results regarding salesperson knowledge. The analysis revealed that possession of customer-related knowledge and solution-value knowledge distinguished high performers from low performers.

Intrafirm relationship network As depicted in Fig. 3, high performers (M = 2.5) maintained more contacts inside their sales workgroup (e.g., peer salespeople) compared to low performers (M = 1.3). The results from a one-way ANOVA demonstrate a significant link between inside-workgroup network size and salesperson performance ($F = 4.83$, d.f. = 2, 54; $p < .05$). Group comparisons revealed that high and low performers differed significantly ($F = 1.26$, $p < .05$). Additionally, compared to low performers (M = 1.8), high performers (M = 4.3) maintained significantly more contacts outside their workgroup (e.g., dispatchers, terminal managers, and customer service specialists). The results from a one-way ANOVA demonstrate a significant link between outside-workgroup network size and salesperson performance ($F = 7.12$, d.f. = 2, 54; $p < .05$). Group comparisons again revealed significant differences between high and low performers ($F = 2.42$, $p < .05$). Drawing on marketing and social network literature to guide our analysis, we interpreted high-performing salespeople's structural relationship patterns as an indication that high performers act as intrafirm intermediaries. Research suggests that being an intrafirm intermediary involves participating in many networks that connect organizational members (Van den Bulte and Wuyts 2007). Salespeople who maintain a high volume of interaction traffic between groups can be viewed as important "intermediate stations" for information flow across the groups (Wasserman and Faust 1994). Moreover, our results suggest that salespeople who have individual interactions with many people outside the sales workgroup also create or contribute to cross-fertilization of ideas, techniques, and approaches for sales-related problem solving within the firm (Bolander et al. 2015).

Customer-related knowledge The high-performing salespeople in our study were more likely to categorize customers in terms of meaningful customer-related characteristics. Specifically, high performers demonstrated more knowledge of their customer's product and service needs. Because high performing salespeople were more skilled at creating solutions for customers, they were also more likely to mentally organize knowledge based on what customers need from relationships with their partners. This is in line with extant research that describes knowledge about customers and product features in terms of quantity of concepts (Verbeke et al. 2011), and defines customer-related knowledge as organized, structured, beliefs and understanding about different types of customers (Menguc et al. 2013, p. 21). Consequently, customer-related knowledge represents the product and service requirements that a customer would like the firm to fulfill. For example:

> I classify customers based on different types of service requirements that customers may require. Some people require expedited service, other people require just

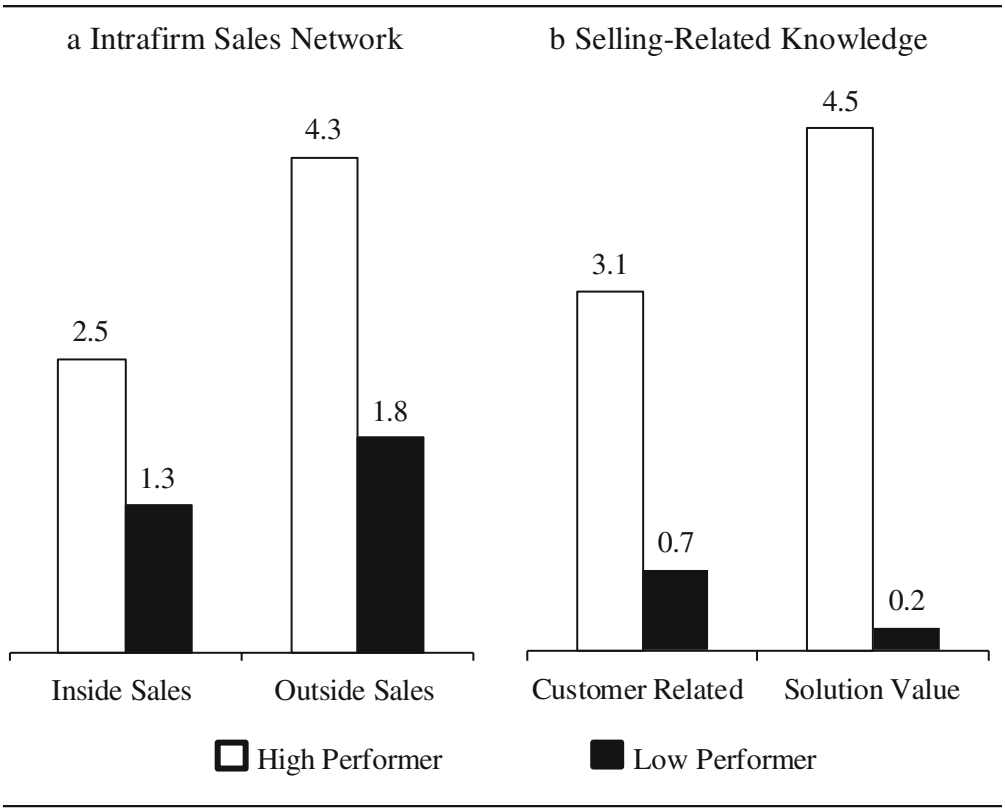

Fig. 3 High versus low performer salespeople. Note: Intrafirm Sales Network measured as the number of direct relationships with other firm members; Selling-related knowledge measured as the number of knowledge concepts

Notes: Intrafirm Sales Network measured as the number of direct relationships with other firm members; Selling-related knowledge measured as the number of knowledge concepts.

regular standard service, and other people may have an international demand.

Further examples of customer-related knowledge from the interviews include "My chemical manufacturers need hazardous shipping service," "These customers need to meet demanding deadlines and look for service speed," and "This group wants a large amount of personal contact and personalized assistance." We coded the number of customer-related knowledge constructs elicited from each salesperson. High-performing salespeople use more customer-related knowledge (M = 3.1) than low performing peers (M = 0.7) (Fig. 3). A one-way ANOVA yielded a significant relationship between customer-related knowledge and salesperson performance ($F = 3.64$, $p < .05$), and group comparisons revealed that high and low performers were significantly different ($F = 2.32$, $p < .05$).

Solution-value knowledge Analysis of the cognitive maps revealed that higher performers were more adept at linking key solution characteristics to their firm's financial objectives, reflecting their greater value-creation skills; higher-performing salespeople show a greater ability to advance firm-strategic objectives and strengthen financial performance through the creation of customer solutions. This finding is in line with existing research that suggests that knowledge structures are based on the patterns salespeople develop to organize information, and with research that shows that links between knowledge concepts reflect causal relationships discerned from past experiences that serve as guides for future action. These knowledge structures ultimately drive performance (Day et al. 2001; Ellis and Davidi 2005).

Consequently, we measured solution-value knowledge as the explicit connections in a salesperson's knowledge structure between solution characteristics and their firm's profit or revenue objectives. Solution characteristics include identification of product and service needs of customers (including customization), deployment characteristics, and post-deployment characteristics (Tuli et al. 2007). Firm revenue and/or profit characteristics include classifications of customers in terms of their profit or revenue production (e.g., high profit potential, low profit potential, high revenue, average revenue, low revenue). The example statement below, taken from the interview transcriptions, demonstrates a link between customer needs and revenue potential and profit:

> Well, once again the services we offer with some of the larger revenue potential, our global services. Some of the smaller revenue potential accounts use them on occasion, but not as much as the higher

> revenue potential. And, obviously our specialized services equate back to profit. When they use those services we make money on it.

The following statement reveals a link between the deployment characteristic of "odd-dimension freight" and the firm's profitability:

> If you have something that's 20-foot long and it's going to have to go across the floor on one of our trucks it's really hard to work with, it's hard to move around and it doesn't look very good in our costing system. But if you take something that's on a skid and it's packaged well and the guy just has to use a forklift to take it in there and it's heavy, it's dense, then it's more profitable.

The response below shows a link between post-deployment service and firm profit:

> As a general rule we don't solicit that kind of business. Our drivers have been told not to pick up anything but we know that it is very profitable so I go after it. Anytime I know that they can live with our service standards into the state of Florida, I'll try to solicit that business because it's very profitable for us.

Further examples of solution-value knowledge include: "These customers are in hot destination cities, points that are profitable for us," "… accounts to avoid as they are susceptible to high claims and service problems," and "… accounts with high stem times have costs associated with them that detract from profitability." We counted the number of explicit connections that salespeople made between solution characteristics and firm profit or revenue to assess solution-value knowledge. High performing salespeople possessed more solution-value knowledge (M = 4.5) in memory than did low performers (M = 0.2), as displayed in Fig. 3. The results from a one-way ANOVA demonstrate a significant relationship between solution-value knowledge and salesperson performance ($F = 3.93$, $p < .05$). Group comparisons revealed that high and low performers were significantly different ($F = 1.12$, $p < .05$).

Discussion

Study 1 relied on sales performance categories (high, average, low) as the outcome influenced by knowledge and intrafirm relationships. Study 2 uses a continuous measure of performance, annual sales. Study 1 revealed that maintaining a highly central position among inside and outside work-group members enhances salesperson performance. We interpreted having many contacts outside and inside the workgroup as occupying an intrafirm intermediary position. In Study 2, we more explicitly test the intermediary position effects on performance, by focusing on the representative who connects peer salespeople to non-sales individuals, providing control over non-redundant resources and information (Fernandez and Gould 1994). In Study 1, more effective salespeople possessed more of the knowledge needed to serve customers and add value to the firm. Consistent with marketing literature (Verbeke et al. 2011), we interpreted SRK as the foundation of a salesperson's selling skill. In Study 2, we extend these findings by testing the moderating effects of SRK on the relationship between the representative intermediary position and salesperson performance.

Study 2: Representative position with marketing and product development

In Study 2, we measure the representative position explicitly, capturing the exclusive access and influence exerted by those who play the intermediary role (Gould and Fernandez 1989). We conceptualize and measure SRK as selling-related skill that comprises both customer-related knowledge and solution-value knowledge. Next, we hypothesize and empirically assess non-linear effects of the representative position. Last, we hypothesize that the non-linear effects of a representative position on sales performance are moderated by SRK.

Representative intermediary position and selling-related knowledge

Acting as an intrafirm intermediary drives salesperson performance, due to the representative salesperson being more influential within their firm as a result of access to and control over the flow of non-redundant information between actors whose interests are interdependent (Bolander et al. 2015; Gonzalez et al. 2014). Peer salespeople are dependent on the representative salesperson for exclusive access to non-sales knowledge. Maintaining more representative positions allows the salesperson to leverage their influence and extract greater knowledge and cooperation from peers to improve their performance and engage in information arbitrage to act strategically (Burt 2005). Controlling exclusive access in relationships gives the representative a disproportionate say in whose interests are served when connecting peers with individuals from different groups (Burt 2005). A representative salesperson also gains an informational advantage and learns early about activities within the firm that others do not, spreading new ideas and behaviors (Bolander et al. 2015). This makes the representative salesperson more attractive to peers and their non-sales contacts, and considered by them for inclusion in new opportunities, leading to greater firm visibility and promotion (Van den Bulte and Wuyts 2007).

We center on occupying the representative position with the two key intrafirm functions on which salespeople are most

dependent: marketing and product development. We draw on management theory of knowledge transfer across organizational boundaries based on knowledge domain difference and interdependence to develop our hypotheses (Carlile 2004). Research shows that sales and marketing functions represent different thought worlds, sales being more short-term and customer oriented and marketing more long-term and product oriented (Homburg and Jensen 2007). Despite these domain differences, their orientations complement each other and their cooperation results in positive outcomes for the firm (Ernst et al. 2010; Homburg and Jensen 2007). Sales and marketing groups are aware of their dependencies and differences, which revolve around activities like lead generation, lead conversion, customer retention, and renewals. Thus, marketing routinely produces knowledge that complements sales knowledge and can be used by salespeople to improve performance, and a shared vision between marketing and sales has been shown to drive positive performance effects (Rouziès and Hulland 2014). As a result, a common lexicon and shared meanings facilitate knowledge sharing at the boundary, making it easier for the representative salesperson to transfer marketing knowledge to peer salespeople and quickly reap the benefits of being more influential. The challenge in transferring knowledge under this condition is increasing capacity to process more marketing information (Carlile 2004). Representative salespeople will reach their capacity to process information exchanges between the groups and experience diminishing returns to occupying the representative position. Taking the representative position too often means they cannot share as much or cannot share as completely, because they become overwhelmed by the demands of maintaining an excessive volume of information exchange, limiting their influence. Therefore:

H1: There is an inverted U-shaped relationship between a representative position with marketing and salesperson performance.

Product development is primarily centered on the generation of technological knowledge and its application to design new market offerings, and is not related directly to selling activities (Ernst et al. 2010). Research shows that sales and product development connections in the new product development process matter most during concept and product development and not during implementation (Ernst et al. 2010; Homburg et al. 2017). The concept development and product development stages include activities such as idea generation, concept development, design development, and prototyping. These activities produce novel and technical product knowledge that is very different from that used by the sales force. Moreover, the connection between sales and product development is stronger in dynamic solution selling contexts (Homburg et al. 2017), increasing the complexity of knowledge generated by product development. Thus, the dependencies and differences between sales and product development are unclear, and the challenge under this condition is to create common or shared meanings to assess and transfer product development knowledge (Carlile 2004).

Consequently, salespeople who occupy the representative position require more opportunities to transfer knowledge in order to effectively translate meanings and negotiate interests across product development and sales (Carlile 2004). Too few opportunities to do so limits their effectiveness at knowledge transfer and the amount of influence they gain, negatively impacting performance. Moreover, because product development knowledge is focused on new or soon to be new offerings, occupying too few representative positions exposes the salesperson to the risk of having peers who are not interested or cannot use knowledge that is not readily applied to selling activities for the products their customers currently need, leaving the representative salesperson unable to gain influence over their peers. Therefore:

H2: There is a U-shaped relationship between a representative position with product development and salesperson performance.

Salesperson knowledge is inextricably linked to selling skill. SRK represents knowledge that salespeople use in selling complex solutions to their customers, indicated by customer problem-solving skills that produce knowledge-based solutions rooted in the quantity and richness of the salesperson's solution-relevant knowledge (Verbeke et al. 2011). For example, research shows that salespeople who more skillfully modify their solution-selling behaviors and tactics in order to grow customer lifetime value possess quick problem-solving heuristics that represent a higher level of causal knowledge or customer "growth" related knowledge (Kumar et al. 2014). Those higher in SRK have a greater ability to deal with complex solution selling activities, and manage key uncertainties in the solution-selling process. For example, SRK helps salespeople reduce outcome uncertainties or customer doubts about issues related to the performance that ought to be realized from a solution (Ulaga and Kohli 2018).

The extent to which salespeople possess SRK moderates the non-linear effects on sales performance of a representative position in marketing and product development. SRK is the prior knowledge possessed by representative salespeople that allows them to identify, assimilate, and transfer novel or ambiguous knowledge from disparate thought worlds to their peers (Cohen and Levinthal 1990). Regarding marketing, SRK is critical knowledge that helps salespeople make sense of complex customer environments and the ways that customers offer value to the firm, increasing a representative salesperson's ability to effectively assess and share diverse

information gained from marketing. For representative salespeople with marketing, those high in SRK will leverage this skill to assess and transfer marketing knowledge more effectively. Greater effectiveness in knowledge transfer allows representative salespeople to be less strained during the activation of the network and process a higher volume of exchanges (Wasserman and Faust 1994). Thus, those higher in SRK can occupy more representative positions with marketing before realizing diminishing returns, while those low in SRK realize diminishing returns occupying fewer representative positions with marketing.

The non-redundant knowledge acquired by those in representative positions with product development provides new and different lenses through which salespeople can view problems and develop solutions (Homburg et al. 2017; Perry-Smith 2014). But, product development knowledge represents knowledge framed in the perspectives of design and development, making ambiguous or unclear how it can impact sales activities (Ernst et al. 2010). In this case, being an intermediary with product development becomes more difficult because of a lack of a common language or shared meanings with sales, and representative salespeople need to be capable of converting this knowledge into the sales force's shared understandings (Carlile 2004; Tortoriello et al. 2012). SRK allows a representative salesperson to cope with this uncertainty, making them better able to assess and translate product development knowledge into sales knowledge their peers can readily use. Thus, SRK is the skill that representative salespeople leverage to translate product development knowledge into sales knowledge across a larger number of exchanges to increase their influence and improve their performance. Therefore, salespeople with high SRK experience enhanced effects of occupying a larger number of representative positions with product development on performance. Alternatively, those low in SRK will be less able to experience enhanced performance by occupying a larger number of representative positions with product development. Therefore:

H3: SRK moderates (a) the inverted U-shaped relationship between a representative position with marketing and salesperson performance and (b) the U-shaped relationship between a representative position with product development and salesperson performance.

Sample and data collection

We collected data from a provider of business intelligence services including market assessment, decision analytics, and financial and credit information. The firm operates globally and is listed on the FTSE 100 Index of the London Stock Exchange. The company presents an ideal research context due to its complex customer-relationship management practices, which require deep knowledge of customers to design customized solutions for them. Salespeople must manage individual accounts in a way that allows them to identify specific needs and configure an array of products and services to solve problems. Skill at forming valuable customer relationships and coordinating intrafirm colleagues' expertise constitute key drivers of salesperson success.

A questionnaire was sent by email to a business unit with 310 salespeople. Three follow-up mailings were conducted, each seven days apart. To ensure high quality responses, the vice-president of sales and vice-president of marketing signed the email, and the regional sales managers personally informed the salespeople of the research relevance. The senior human resource executive and the research team were in charge of follow-ups. Two hundred and ninety-seven salespeople were available to participate in the study, and 13 were on leave from the firm for either vacation or medical reasons. A 25-day data collection effort produced a response rate of 68%, yielding 203 completed questionnaires.

In the questionnaire, we included name-generating questions for each salesperson to answer: "To whom have you gone for any professional help or advice over the last month?" "To whom do you talk when you miss a work-related meeting?" "With whom outside your workgroup do you maintain a personal relationship of a professional nature?" We adopted a free-recall method in which respondents received all questions and generated a list of contacts after reading the questions (Wasserman and Faust 1994). The firm provided the names and functions of all employees, allowing us to identify salespeople and those outside the sales function. The name-generating questions elicited a total of 1412 unique and non-repeated ties. From these, salespeople naming a peer salesperson represented 895 ties, and salespeople naming a non-salesperson represented 517 ties (267 individuals). We estimated the network relational response rate, which accounts for the total possible number of ties in a non-directed network (Knoke and Yang 2008). The relational response rate for our sample is 93%, indicating that the vast majority of possible connections among those in the sample frame were accounted for.

Measures

We measured performance using *annual sales*, the salesperson performance indicator that constitutes the key metric by which the firm assesses salesperson performance. We collected each salesperson's annual sales for the one-year period after survey data collection. The lag in time from survey implementation to the collection of sales performance data follows other research that has appropriately evaluated the effects of intrafirm network characteristics on salesperson performance (e.g., Bolander et al. 2015). The firm provided annual sales data for each salesperson from archival financial records.

We assessed the degree to which each salesperson acts as a representative. This condition is denoted as *ijk,* where representative salesperson *j* is positioned between *i* and *k*. Specifically, a peer salesperson *i* is directly tied to the focal salesperson *j*, and salesperson *j* is tied directly to individual *k* from outside the sales function, but *i* is not directly tied to *k*. We used the firm functional areas as the distinct subworkgroups *m*. The salespeople *i* and *j* are part of the same intrafirm function *m* (sales), while *k* is part of a different intrafirm function *m*. Thus, $m_i = m_j \neq m_k$. Fourteen different functions *m*, including sales, were identified in the firm. We relied on UCINET 6 to generate the representative scores (R_j) for each salesperson *j*, which calculates the measure as specified by Gould and Fernandez (1989). The representative position measure is estimated as follows:

$$R_j = \sum_{i}^{N} \sum_{k}^{N} R(ik),$$

where N is the number of individuals in the intrafirm network, *R*(*ik*) equals 1 if *ijk* is true and $m_i = m_j \neq m_k$, and 0 otherwise. The measure captures the absolute number of representative position relations that the focal salesperson maintains. We computed *ijk* where salesperson *i* is positioned between peer *j* and (a) individual *k* from marketing, (b) individual *k* from product development, (c) individual *k* from any non-marketing and non-product development function (other functions), and (d) individual *k* from any non-sales function (overall representative). Using these specific measures, a salesperson can occupy a representative position differently. For example, having exclusive ties with one person in marketing and four with peer salespeople or four ties in marketing and one with a peer salesperson produces similar scores. The construct validity of the representative position has been established in the management literature (e.g., Gould and Fernandez 1989). The Web Appendix provides details on construct validity of the measure using the sample data from Study 2.

We employed a weighted composite measure to capture SRK. In developing the SRK measure we followed the recommendations made by MacKenzie et al. (2011) to assess concept definition, content validity, and measure evaluation. Concept definition includes identification of what the construct is intended to conceptually represent. The measure captures a salesperson's SRK by assessing their macro-sales skill, which includes their technical skill selling products based on customer needs and their problem-solving skill when selling high-value, knowledge-based solutions. These two dimensions of macro-selling skill, customer-related knowledge and solution-value knowledge, emerged in Study 1 and are key drivers of salesperson performance in the marketing literature (Verbeke et al. 2011).

We assess SRK for each individual salesperson *j*. First, we captured solution-value knowledge, generating a solution value weight (SVW). We began by scrutinizing the firm's offerings with the chief sales and marketing executives. The offerings *v* were distinguished from one another based on the extent to which they represented a customizable product-and-service combination and on the extent to which they were strategically valuable for building customer relationships. Selling more customizable and strategically valuable offerings requires salespeople to have solution-value knowledge characterized by greater quantity and richness. The sales and marketing executives identified 13 offerings that encompassed a representative range of customization and strategic value. Then a panel composed of three category managers and the marketing executive assessed each offering *v* in order to generate SVW. Two panel members rated each offering on a seven-point scale, where one indicated that the offering was an off-the-shelf product with low customization and low strategic value (e.g., smart search for records and reports), and seven indicated that the offering was highly customizable and of high strategic value (e.g., integrated decision analytics and market segmentation software module). The third panel member resolved any discrepancies, and the marketing executive validated the ratings. The final rating for each offering on the seven-point scale represented the offering's SVW. By generating the list of offerings and weights, the panel members assured content validity by assessing two key aspects of the measure: a) the individual items represent solution value-knowledge, and b) the items as a set were representative of the entire content domain of SRK (MacKenzie et al. 2011).

Second, we assessed the salesperson's customer-related knowledge (CRK). The survey presented a list of the 13 offerings to the participating salespeople and requested that they rate each offering *v* using the following question: "How skilled are you at handling this offering based on the customer's needs?" CRK was captured on a scale of 1 to 7 (1 = not at all confident, 7 = very confident). We then computed each salesperson *j's* weighted composite measure of SRK (SRK) as follows:

$$SRK_j = \sum_{1}^{v} (SVW_v \times CRK_v),$$

where the product of SVW_v and CRK_v for each of the 13 offerings *v* was summed for salesperson *j,* the SRK measure captures salesperson customer-related knowledge and solution-value knowledge as reflected in their macro-selling skill. We conceptualize the two sub-dimensions (SVW and CRK) as the defining elements of SRK, and combined them in a multiplicative fashion as SRK represents the intersection of solution-value knowledge and customer-related knowledge (MacKenzie et al. 2011). Finally, we assessed criterion validity and nomological validity of the SRK measure. We used SRK as a predictor of sales growth and opportunity wins, and the network variables and control variables as predictors of

SRK (MacKenzie et al. 2011). As expected, we found SRK to relate to other measures in a manner consistent with marketing theory (Verbeke et al. 2011).

We included three control variables. We included a variable to control for salesperson *territory size* that captures the potential sales volume estimated in the salesperson's sales territory. *Tenure at the firm* represents the number of years the respondent has worked as a salesperson at the company. The variable *sales share* is the proportion of individual annual sales relative to the total annual sales of the office to which the salesperson belongs. The variable *representative position spread* represents the heterogeneity in the overall representative measure, capturing how evenly distributed or spread out the representative contacts of a salesperson are across all non-sales function. We used the index of qualitative variation (IQV) to capture spread (Knoke and Yang 2008). Higher values of IQV indicate that representative contacts are evenly spread out across the non-sales functions a representative salesperson is connected to. Lower values indicate that representative contacts are concentrated in fewer or a single non-sales function. We used the *representative position – other functions* measure of representative ties to non-sales ties who are not in marketing or product development to control for total number of representative ties.

The descriptive statistics and correlations for all constructs appear in Table 2. Initial evaluation of the ties generated by salespeople, revealed a sufficient number of sales and non-sales ties to create variation in the data used to capture the effects of the representative position. Total number of unique ties between salespeople was 895, between salespeople and members of marketing was 70, and between salespeople and members of product development was 99. This dispersion pattern suggests that variation in the representative position is driven mostly by the number of peers who seek out the representative salesperson.

Results

We tested our hypotheses using moderated regression analyses. In Table 3, we summarize the results of the ordinary least squares regression analyses for four models: main effects of representative position with marketing and product development (Model 1); moderation effects of representative position with marketing and product development (Model 2); squared measures of representative position with marketing and product development (Model 3); and moderation effects of squared measures of representative position with marketing and product development (Model 4). The variables in the moderation and squared models (2–4) were all mean centered. We assessed the robustness of our measures and estimation approach using variance inflation factors and condition index, which ruled out multicollinearity concerns.

Model 1 displays significant and positive main effects of a representative position with marketing ($\beta = .30$, $p < .01$) and product development ($\beta = .17$, $p < .01$), and SRK on annual sales ($\beta = .10$, $p < .05$). In Model 2, we find a significant and positive interaction effect on annual sales between a representative position with product development and SRK ($\beta = .16$, $p < .01$). To test the hypotheses, Model 3 results indicate an inverted U-shaped effect of a representative position with marketing ($\beta = -.20$, $p < .05$) and a significant U-shaped effect of a representative position with product development ($\beta = .61$, $p < .01$) on annual sales, in support of H1 and H2 respectively. In Model 4, SRK moderates the U-shaped effect of a

Table 2 Descriptive statistics and correlations

Variable	M	SD	Correlation Matrix							
			1.	2.	3.	4.	5.	6.	7.	8.
1. Annual sales[a]	4.51	7.84								
2. Representative position marketing	1.14	3.28	.48**							
3. Representative position product development	1.08	2.54	.20**	.19**						
4. Selling-related knowledge[b]	3.26	0.36	.18**	.16*	.00					
5. Territory size[a]	175.00	183.00	.36**	.31**	.11	.00				
6. Tenure at firm	8.17	6.13	.25**	.21**	.14	.15*	.00			
7. Sales share	0.22	0.22	−.08	−.18**	−.16*	−.00	−.40**	−.08		
8. Representative position - other functions	3.84	7.71	.46**	.24**	.06	.08	.08	.27**	−.13	
9. Representative position - spread	0.36	0.45	.07	−.23**	.39**	.02	.05	.16*	−.17*	.28**

*$p < .05$

**$p < .01$

[a] in 000,000's

[b] in 00's

Table 3 Study 2 results: representative position and selling-related knowledge on performance

Variable	Hypothesis	Annual Sales			
		Model 1	Model 2	Model 3	Model 4
Main Effects					
Representative position marketing		.30 (5.16)**	.35 (4.30)**	.38 (3.13)**	.40 (2.67)**
Representative position product development		.17 (2.94)**	.12 (1.95)**	−.39 (3.41)**	−.29 (2.47)**
Selling-related knowledge (SRK)		.10 (1.83)*	.09 (1.76)*	.08 (1.68)*	.05 (0.70)
Non-linear Effects					
Representative position marketing squared	H_1			−.20 (1.74)*	−.21 (0.93)
Representative position product development squared	H_2			.61 (5.49)**	.40 (3.03)**
Moderating Effects					
Representative position marketing x SRK			−.06 (0.73)		.16 (1.18)
Representative position product development x SRK			.16 (2.94)**		−.14 (1.48)
Representative position marketing squared x SRK	H_{3a}				−.16 (0.86)
Representative position product development squared x SRK	H_{3b}				.29 (2.45)**
Control Variables					
Territory size		.28 (4.66)**	.26 (4.50)**	.31 (5.56)**	.28 (5.01)**
Tenure at firm		.08 (1.52)	.09 (1.61)	.11 (2.20)*	.11 (2.16)*
Sales share		.13 (2.32)**	.14 (2.43)**	.14 (2.65)**	.14 (2.61)**
Representative position - other functions		.40 (6.99)**	.41 (7.19)**	.38 (7.28)**	.37 (6.89)**
Representative position - spread		−.18 (3.09)**	−.16 (2.64)**	−.08 (1.35)	−.09 (1.49)*
R-squared		0.476	.500	.554	.577
Adjusted R-squared		0.455	.474	.530	.546
F-statistic		22.07**	19.17**	23.81**	18.34**
Degrees of freedom		(8, 194)	(10, 192)	(10, 192)	(14, 188)

*p < .05 (one-tailed)

**p < .01 (one-tailed).s

The table reports standardized coefficients with |t-values| in parentheses

representative position with product development on annual sales (β = .29, $p < .01$), supporting H3b. We do not find support for H3a, which might be due to marketing sharing common language elements and meaning with sales, rendering the absorptive and translation skills of SRK unnecessary. In addition, all control variables significantly affect annual sales. In Model 4, territory size (β = .28, $p < .01$), tenure at the firm (β = .11, $p < .05$), sales share (β = .14, $p < .01$), and representative position with other functions (β = .37, $p < .01$) positively affect salesperson annual sales, while representative position spread (β = −.09, $p < .05$) negatively affects annual sales. The effects in Model 4 explain 58% of the variance in performance.

Sensitivity analysis

We estimated models with an alternative measure of salesperson performance to conduct a sensitivity analysis of the hypothesized effects. We did so to increase confidence in our conceptual model and to ensure more robust findings. As depicted in Table 4, we estimated the main effects, squared effects, and interaction effects using an alternative dependent variable, opportunity wins. This variable captures a salesperson's ability to convert prospective sales opportunities into sales revenue. The results were similar to those that used annual sales as the dependent variable (Models 1–4). Model 7 results reveal an inverted U-shaped effect of a representative position with marketing (β = −.23, $p < .05$) and a significant U-shaped effect of a representative position with product development (β = .65, $p < .01$), further supporting H1 and H2 respectively. Finally, Model 8 results show that SRK moderates the effect of a representative position with product development on opportunity wins (β = .32, $p < .05$), further supporting H3b. The sensitivity analyses results add to our confidence in the robustness of the theoretical underpinnings of our conceptual model.

Table 4 Post hoc sensitivity analyses

Variable	Hypothesis	Opportunity Wins			
		Model 5	Model 6	Model 7	Model 8
Main Effects					
Representative position marketing		.19 (2.84)**	.29 (3.13)**	.29 (2.02)*	.37 (2.09)*
Representative position product development		.12 (1.87)*	.06 (0.85)	−.48 (3.59)**	−.39 (2.77)**
Selling-related knowledge (SRK)		.13 (2.13)*	.12 (1.91)*	.12 (2.01)*	.03 (0.40)
Non-linear Effects					
Representative position marketing squared	H_1			−.23 (1.69)*	−.29 (1.08)
Representative position product development squared	H_2			.65 (5.08)**	.44 (2.79)**
Moderating Effects					
Representative position marketing x SRK			−.13 (1.45)		−.04 (0.26)
Representative position product development x SRK			.17 (2.76)**		−.15 (1.28)
Representative position marketing squared x SRK	H_{3a}				.03 (0.13)
Representative position product development squared x SRK	H_{3b}				.32 (2.23)*
Control Variables					
Territory size		.28 (4.06)**	.26 (3.83)**	.31 (4.83)**	.28 (4.23)**
Tenure at firm		.07 (1.07)	.07 (1.18)	.10 (1.66)*	.11 (1.67)*
Sales share		.13 (1.90)*	.13 (1.97)*	.14 (2.17)*	.13 (2.09)*
Representative position - other functions		.30 (4.54)**	.32 (4.86)**	.28 (4.60)**	.29 (4.60)**
Representative position - spread		−.11 (1.62)	−.08 (1.23)	−.00 (0.03)	−.02 (0.23)
R-squared		.304	.336	.394	.413
Adjusted R-squared		.275	.301	.363	.370
F-statistic		10.59**	9.70**	12.50**	9.46**
Degrees of freedom		(8, 194)	(10, 192)	(10, 192)	(14, 188)

*p < .05 (one-tailed)

**p < .01 (one-tailed)

The table reports standardized coefficients with |t-values| in parentheses

Graphical analyses of effects

To explore the moderation effects, we conducted graphical analyses using the standard deviation from the mean to make comparisons (Aiken and West 1991). In Fig. 4, panels A–C depict the non-linear effects of representative positions on salesperson performance. Panel A shows the inverted U-shaped effect of a representative with marketing on salesperson performance (Model 3). Salesperson performance is higher with more representative positions with marketing (simple slope; $t = 3.61$, $p < .01$) and as this increases they reach a maximum performance level. Panel B demonstrates the U-shaped effect of a representative position with product development on salesperson performance (Model 3). Low levels of product development representative positions are detrimental to sales performance ($t = -4.21$, $p < .01$), while high levels positively drive performance ($t = 4.27$, $p < .01$). Panel C depicts how SRK moderates the U-shaped effect of a representative position with product development on annual sales (Model 4). Salespeople with high SRK benefit from more representative positions with product development ($t = 4.51$, $p < .01$), while low levels of SRK are detrimental ($t = -2.38$, $p < .01$).

Marginal effects analyses

To further investigate the effects of the representative position on sales performance, we used a "diagnostic tool" that employs marginal effects analysis (Srinivasan et al. 2011). Using the estimates from Models 3 and 4, we obtained the standard error and confidence intervals of the salesperson specific marginal effects to assess their significance. Drawing 1000 samples of the coefficients for each marginal effect from a normal distribution, we obtained the lower and upper limits of a 95% confidence interval for the marginal effects of a given salesperson to assess if the effects were significantly different from zero. If a salesperson's marginal effects lie within the corresponding confidence limits the investments made in taking the representative positions are nearly optimal. If the marginal effects are below they represent under investment, and if the marginal effects are above they represent over investment. The diagnostic tool assesses whether salespeople in our

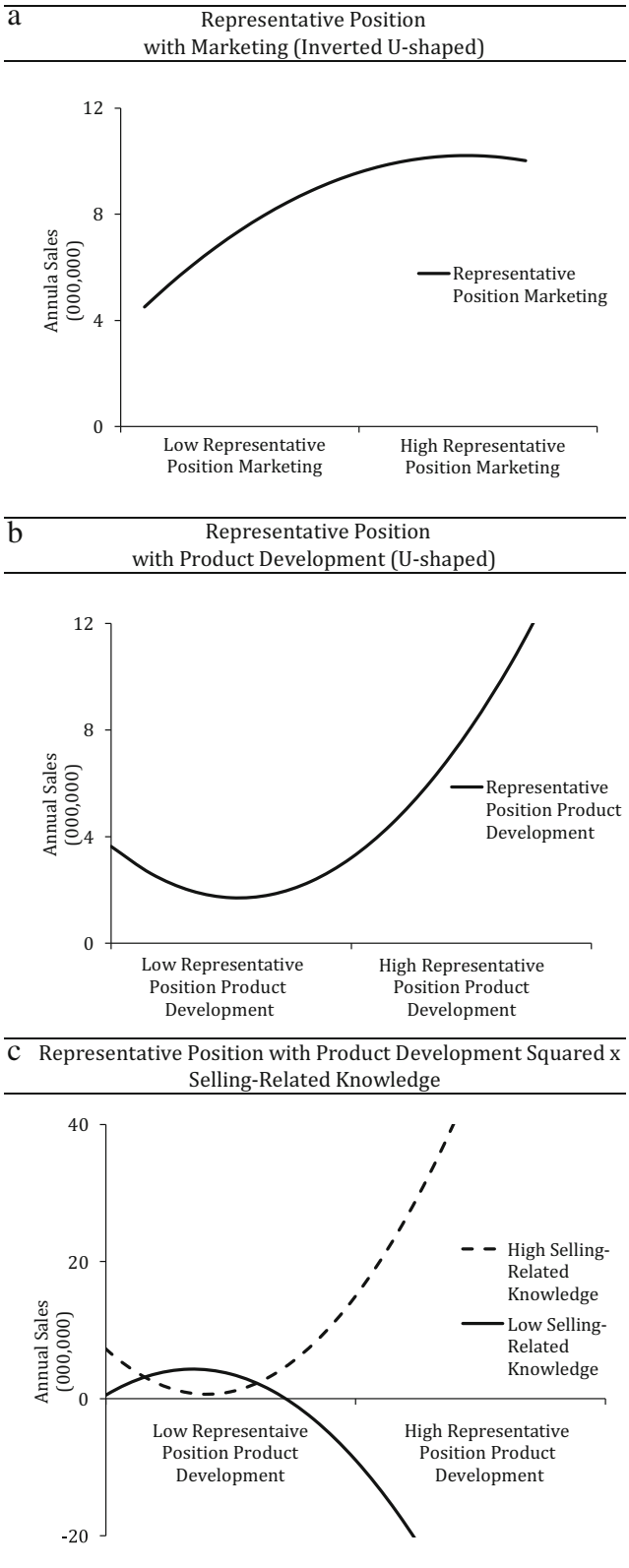

Fig. 4 Graphical analysis of non-linear effects and moderation on sales performance

sample should increase or decrease investments in one representative position (e.g., marketing) while accounting for their investment in the other (e.g., product development), and accounting for the contingent effects (i.e., SRK) and control variables. We also assessed the marginal effects for the interaction of high (low) SRK with the representative position on salesperson performance. This method was introduced by Krinsky and Robb (1986), and has been used in marketing by Mantrala et al. (2007) and Srinivasan et al. (2011). See the Web Appendix for statistical procedure details.

As illustrated in Table 5, we find a striking proportion of salespeople in our sample overinvesting in representative positions with marketing (89%), and a large proportion underinvesting in representative positions with product development (79%). Overwhelmingly, salespeople in our sample could enhance their performance by increasing their investments in representative positions with product development (non-linear parameter marginal effect: $\beta = .82$, $p < .01$) and decreasing their investments in representative positions with marketing (non-linear parameter marginal effect: $\beta = .02$, $p < .05$). Noteworthy, the picture comes into sharper focus when considering the interaction between the representative position with product development and SRK. We continue to find that salespeople with high SRK underinvest in representative positions with product development (82%), while those with low SRK display the highest proportion of nearly optimal performance (26%). The largest gains in performance can be made if salespeople high in SRK invest more in representative positions with product development (marginal effect at high SRK: $\beta = .59$, $p < .01$).

Discussion

Study 2 more stringently tests the impact of salespeople acting as representative intermediaries between their peers and others in key non-sales intrafirm functions. The results show that high performers are more likely to seek out and acquire information from members of intrafirm functions on which all salespeople depend to do their jobs, and serve as exclusive sources of that information for peers. Study 2 uses a measurement of salesperson knowledge to capture and assess the salesperson's selling-related skill, which is based on their level of customer-related and solution-value knowledge. The study provides unique insights into the non-linear effects of the representative position on performance. SRK affects the non-linear relationship between the representative position and sales performance. This finding supports our contention that representative salespeople with greater selling-related skill possess more prior knowledge that is important to the sales performance objectives all salespeople share, making representative salespeople more influential sources of information for their peers.

Table 5 Proportions of salespeople representative position investments

A: Representative Position on Sales Performance			
	Proportions of Salespeople		
Representative Position	Underinvesting	Nearly Optimal	Overinvesting
Representative position marketing	6%	5%	89%
Representative position product development	79%	7%	14%
B: Representative Position and Selling-Related Knowledge on Sales Performance			
	High Selling-Related Knowledge Salespeople		
Representative Position	Underinvesting	Nearly Optimal	Overinvesting
Representative position product development	82%	6%	12%
	Low Selling-Related Knowledge Salespeople		
	Underinvesting	Nearly Optimal	Overinvesting
Representative position product development	59%	26%	15%

Notes: For example, 79% of salespeople could increase sales performance by increasing representative position with product development. 82% of salespeople with high selling-related knowledge could increase sales performance by increasing representative position with product development.

General discussion

Implications for marketing theory

Study 1 showed that higher performing salespeople had more ties to individuals inside and outside their immediate workgroup, suggesting an intermediary role. In Study 2, centering on the representative position, salespeople acted as exclusive connections between their peers and individuals in marketing and product development. When examining the representative positions with marketing and product development, we found contrasting non-linear effects. These findings add to the literature on salesperson intrafirm networks by showing that salespeople can realize differential effects depending on the non-sales function they act as intermediaries for (Plouffe et al. 2016; Steward et al. 2010). The findings also add to the literature on salesperson knowledge (e.g. Homburg et al. 2009), as knowledge used to manage relationships with customers (SRK) also enhances the effects of intrafirm relationships on performance. Thus, our research makes three contributions to marketing theory.

First, there are diminishing returns to occupying representative positions with marketing. A balance between the benefits and risks of playing an intermediary role is critical to optimizing performance. This work is the first to show that salespeople can occupy too many representative positions or too few. In addition, the ability of a salesperson to act as an intermediary across intrafirm boundaries is affected by the nature of the knowledge being transferred. Marketing knowledge becomes valuable social capital when a representative salesperson gains exclusive access to and control over it, as it is complementary to sales and can be leveraged quickly to gain influence. The sales–marketing connection is natural, with clear group interdependencies that make an influential representative salesperson more prominent. But, there are diminishing returns to taking too many representative position ties with marketing, as salespeople approach their capacity to process greater information exchange and a limit to the effects on performance. The marginal analysis accentuates this effect, revealing that, for optimal performance, the vast majority (89%) of salespeople in our sample were overinvesting in the representative position with marketing. This finding contributes to research on intrafirm networks by identifying risks of salesperson intrafirm brokerage and the importance of ties to other functions (i.e., marketing) for intermediaries (e.g., Bolander et al. 2015; Gonzalez et al. 2014).

Second, a larger number of product development representative ties drive performance, but too few are detrimental. Product development generates knowledge such as technical requirements for new products and feedback on design and prototype testing, which salespeople may not understand well or have a need for (Ernst et al. 2010). The sales-product development connection is less natural, and the interdependencies between them are uncertain, obscuring the influence

of a representative salesperson. Salespeople become more influential by occupying more representative positions as it affords them more opportunities to create common or shared meanings to effectively assess and transfer product development knowledge, and connect with those who most need it. This finding adds to both the salesperson intrafirm network literature (Bolander et al. 2015; Steward et al. 2010), and the scarce research on the sales-product development connection (Joshi 2010). Our study is the first to identify the impact on salesperson performance of information exchange between sales and product development (Homburg et al. 2017). Acting as an intermediary for thought worlds that do not generate sales-ready knowledge, like product development, is more arduous and requires greater opportunity or more intermediary ties to be beneficial. The marginal analysis illustrates this further as 79% of those in our sample do not rely enough on representative ties with product development, realizing suboptimal performance.

Third, SRK, which is developed to drive value from customer relationships and is indicative of solution-selling skill, also impacts the effects of intrafirm relationships on salesperson performance. SRK helps representative salespeople absorb and translate knowledge gained from product development ties with whom they do not have a common language or shared meanings (Carlile 2004). This allows them to reap the benefits of establishing more representative ties with product development. This finding refines our understanding of the representative position and contributes to the literature on salesperson knowledge (Homburg et al. 2009; Menguc et al. 2013). The marginal analysis makes this striking effect clearer. In our sample, the vast majority (82%) of salespeople with high SRK were underinvesting in representative positions for optimal performance, while nearly half (41%) of those with low SRK had invested in the right amount or too many representative positions for optimal performance.

Managerial implications

Our research helps clarify a picture developing out of mounting evidence that salespeople should improve their performance through informal intrafirm relationships (Plouffe et al. 2010; Plouffe et al. 2016). Managers should help salespeople balance the benefits and risks of taking intrafirm intermediary positions to optimize performance. Toward this end, three key insights for acting as an intermediary between sales and marketing and product development emerged. First, managers should encourage salespeople to act responsively to peer information-sharing requests for marketing knowledge, but be careful to not overextend themselves. While being an intermediary with marketing may seem easier due to shared language and meanings, salespeople may need to take the position less than seems necessary for optimal performance. Managers can help salespeople map out their network contacts to identify the number of peers who rely on them exclusively for marketing knowledge and assess whether they are being drawn away from their most important relationships, diminishing the benefits gained from being influential. Managers should train salespeople to focus on maintaining representative positions with contacts that provide them with superior knowledge and cooperation or have sought to include them in rewarding opportunities.

Second, managers should help increase a representative salesperson's prominence by building more opportunities for sharing product development knowledge to realize influence benefits and optimize performance. Managers can create these opportunities in several ways. Salespeople can be encouraged to nurture ties with product development and be asked to share their knowledge formally and informally with peers. In formal settings, like meetings, retreats, and sales training sessions, salespeople can be asked to present approaches they have used for leveraging product development knowledge. Managers should encourage those who do not have relationships with members of product development to connect through the representative salesperson. Informally, managers can partner representative salespeople with more novice salespeople to share product development knowledge with them. Managers can also help salespeople map out their ties to make sure that they are not investing in too few representative ties with product development, and train them to see that more representative ties will make them more influential in the firm and improve their performance.

Third, managers should also encourage salespeople to leverage the multipurpose nature of SRK to enhance the benefits gained from being an intrafirm intermediary with product development. SRK is indicative of skills used for selling complex knowledge-based solutions (Verbeke et al. 2011). Salespeople should be trained to realize that the same selling skills that help them manage complexity and uncertainty for customers when selling solutions (Ulaga and Kohli 2018), can be leveraged to help peers when acting as an intermediary with product development. A salesperson who is a representative with product development should be trained to leverage their skill to help peers understand how new products might become part of future customized solutions. They should also be trained to leverage their skill in selling complex solutions to yield greater financial value to the firm by helping peers learn how to better combine new product and service offerings with existing offerings to maximize firm financial value realized from customer relationships.

Limitations and future research

To place our findings in the proper context, we must consider the study's limitations. Study 1 and Study 2 are based on data gathered from a single firm, limiting the generalizability of the findings. However, the consistent findings across both studies

counterbalance this concern. Moreover, the single-firm method has proved useful for exploring complex intra-organizational phenomena and building new theory to address corresponding issues. This is particularly true for studies using network analysis, as many of the measures employed work well when estimated using well-defined network boundaries and specialized populations (e.g., Gonzalez et al. 2014). The representative position accounts for the quantity of intermediary ties maintained by a salesperson. Future research should also investigate the quality of ties maintained by intermediary salespeople and their effects on performance (Steward et al. 2010).

Additional research could also take a more dynamic perspective and explain how the effects of being an intrafirm intermediary accumulate over time or how salespeople evolve to take positions in the intrafirm network to establish themselves as successful intermediaries. Scholars might isolate antecedents of or precursors to intermediary positions. For example, recent research suggests that extroverted salespeople are more likely to become representatives inside their networks (Bolander et al. 2015). Additional individual factors like personality, motivation, or cognitive aptitude should be explored. Research could also further isolate aspects of selling-related knowledge that are critical for improving intrafirm relationship effects. Last, the benefits that accrue to peer salespeople who rely on intermediaries and the effects on their performance could produce novel insights.

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