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Commitment to technological change, sales force intelligence norms, and salesperson key outcomes

Gary K. Hunter [a,1], Nikolaos G. Panagopoulos [b,*]

[a] Department of Marketing, College of Business and Behavioral Science, Clemson University, 273 Sirrine Hall, Box 341325, Clemson, SC 29634-1325, USA
[b] Department of Marketing, The University of Alabama, 126 Alston Hall, Tuscaloosa, AL 35487, USA

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ABSTRACT

Despite increasing interest in sales technology investments, companies continue to struggle with getting their salespeople to use these expensive technologies. In this context, two under-researched issues warrant attention. First, although sales technology represents a continuous source of change, little is known about why salespeople *commit* to technology-induced changes. Second, knowledge on whether *sales force intelligence norms* play a role into translating use of sales technology to performance gains is remarkably sparse. To address these gaps, this study develops a conceptual framework that explores the linear and non-linear effects of commitment to technological change (i.e., affective, normative, and continuance) on sales technology infusion, and, in turn, on two key outcomes (i.e., customer-oriented selling and sales performance). Our framework also advances knowledge on how sales force intelligence norms (i.e., analytical sales processes and knowledge sharing with customers) moderate the relationships between sales technology infusion and key outcomes. Analysis is done using multilevel structural equation modeling on a sample of 303 salespeople nested within 22 firms. Findings support the view that the three components of commitment are distinct, with some counter-intuitive results. Specifically, affective commitment does not exert a significant positive influence as expected; yet, normative commitment does. In contrast, while lower levels of continuance commitment reduce infusion, higher levels have positive effects, thus depicting a U-shaped effect. Finally, sales technology infusion influences both key outcomes — and findings support the importance of fostering sales force intelligence norms. Implications of the study are discussed.

1. Introduction

Salespeople are curators of knowledge, and in an era marked by unprecedented and increasingly complex information, most business to business (B2B) sales jobs are impossible to perform without a heavy dependence on sales technology. Indeed, technology applications such as social customer relationship management (CRM), tablets, and mobile tools are mandated for implementing predictive analytics or big data initiatives (Accenture, 2013). Unfortunately, more than half of the companies recently surveyed continue to struggle with getting their salespeople to use these technologies (Accenture, 2012), whereas most companies realize no benefit to revenue (Miller Heiman, 2014). This disconcerting reality is further amplified when one considers the vertiginous costs associated with implementing sales technologies (Greenberg, 2010). Reflecting the magnitude of this problem for sales organizations, a burgeoning sales technology literature has emerged (e.g., Ahearne, Hughes, & Schillewaert, 2007; Ahearne, Jones, Rapp, & Mathieu, 2008; Avlonitis & Panagopoulos, 2005; Homburg, Wieseke, & Bornemann, 2009; Homburg, Wieseke, & Kuehnl, 2009; Hunter & Perreault, 2006, 2007). While this literature has generated important insights, two notable research questions remain unanswered.

First, little is known about why salespeople commit to the change that accompanies the continuous potential for improvements afforded through new sales technology tools. Change, however, appears to be omnipresent in the domain of sales technology (Ahearne, Lam, Mathieu, & Bolander, 2010). Such changes often alter work routines while disrupting the organization's social fabric (Herold, Fedor, Caldwell, & Liu, 2008). Indeed, companies continuously re-engineer the portfolio of sales technologies made available to salespeople by updating or upgrading existing tools and processes such as the recent move to cloud-based or social CRM applications. Nonetheless, to achieve key outcomes, salespeople must find new ways to integrate an optimal set of technologies into evolving relational selling processes. This aspect of the salesperson's role assumes great importance in light of the fact that technological change alters a salesperson's attitudinal dispositions towards sales technology implementations, shifting critical perceptions such as their commitment to embracing such changes. If firms want to realize return on sales technology investments, they need a better understanding of the underlying attitudinal mechanisms that produce

* Corresponding author. Tel.: +1 205 348 8942; fax: +1 205 348 6695.
E-mail addresses: garyh@clemson.edu (G.K. Hunter), npanagopoulos@cba.ua.edu (N.G. Panagopoulos).
[1] Tel.: +1 864 656 5286; fax: +1 864 656 0138.

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measurable results. Our study fills this gap by investigating the effects of salespeople's commitment to sales technology-induced change on the infusion of the technology into their job. In doing so, we make an additional contribution to the wider marketing literature by getting beyond the more limited insights afforded through single or two-dimensional conceptualizations of commitment that have dominated previous research (e.g., Maignan, Ferrell, & Hult, 1999; Morgan & Hunt, 1994) and employ three dimensions of commitment (i.e., affective, continuance, and normative), each with a common focus on sales technology-induced change. Finally, our research explicitly acknowledges that specific components of commitment (i.e., continuance commitment) may exert curvilinear effects on sales technology infusion. Testing such complex nuances allows us to shed light to intriguing mechanisms underlying salespeople's commitment to technological change, while also contributing to the equivocal and limited research investigating nonlinear effects of commitment (Finegan, 2000; Meyer, Irving, & Allen, 1998).

Second, knowledge on whether attributes of the organizational culture, such as norms, play a role in translating use of sales technology to performance gains is remarkably sparse. However, prior studies outside the marketing literature evidence the pivotal role of norms in technology implementation (Jones, Jimmieson, & Griffiths, 2005) and suggest the simultaneous consideration of key components of organizational culture (Heracleous & Barrett, 2001). In addition, corporate reality pinpoints that firms foster a culture of analytically-driven sales processes, whereby salespeople are expected to adhere to analyzing data to gain deep insights on customer needs (e.g., Homburg, Wieseke, & Bornemann, 2009; Homburg, Wieseke, & Kuehnl, 2009; Kohli & Jaworski, 1990). Salespeople today are knowledge workers (Sheth & Sobel, 2000) providing the organization with capacity for knowledge sharing through technology-dependent, analytical sales processes. Recent meta-analytical evidence, for instance, shows that salespeople have become knowledge brokers who search, leverage, and develop customer-specific knowledge to co-create solutions for customers (Verbeke, Dietz, & Verwaal, 2011). To fill this gap, here we investigate the role of firm-level, sales force intelligence norms (i.e., analytical sales processes, and knowledge sharing with customers) in improving sales technology returns on key outcomes (i.e., customer-oriented selling and sales performance).

The following section articulates the literary background and framework for this study. After formal hypothesis development, the paper details its multilevel structural equation modeling specification and then tests and reports measurement and structural properties. After discussing implications for scholarship and practice, the manuscript concludes by outlining limitations and opportunities for future research.

2. Conceptual background

2.1. Background literature

We conducted a comprehensive review of the extant literature on the consequences of commitment to change to gain insights and inform the development of our conceptual framework. We electronically searched for relevant articles across 26 different journals in the fields of marketing, sales, management, and psychology spanning almost 35 years of research (see Table 1 for a summary of the findings). Four major conclusions can be drawn from our review. First, ours is the first study to propose a measure specifically for the different components of commitment to technological change; the scales employed in prior studies were designed to capture the components of general commitment to change. Second, the majority of the studies examine one or two commitment components; as such, continuance commitment to change has only been employed in 4 studies. Third, commitment to change (especially the affective and the normative components) is positively related to the focal change behaviors investigated in prior studies. Fourth, there were only 3 studies that examined key outcomes, such as turnover or improved organizational performance but none examined the effect of the focal behavior on individual (employee) performance. Fifth, there were only 2 studies that have examined moderating effects and these studies have focused on the interactions among different components of commitment to change as predictors of the focal behavior rather than as predictors of outcomes such as turnover or performance. Thus, the role of moderating factors from the wider micro- or macro-environmental context in the relationship between the focal behavior and outcomes has not previously been examined. More broadly, these characterizations of the commitment to change literature appear consistent with theoretical work in the wider domain of commitment theory, where moderating effects have not been a focal concern (see, for instance, Meyer & Herscovitch, 2001; Meyer, Becker, & Vandenberghe, 2004).

2.2. Conceptual framework

Drawing on the results of our literature review and consistent with the tenets of commitment theory (e.g., Herscovitch & Meyer, 2002; Meyer & Herscovitch, 2001; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002), here we posit that the three components of salesperson commitment to technological change (i.e., an attitudinal variable) will be related to sales technology infusion (i.e., the focal behavior) and, in turn, to two key salesperson outcomes (i.e., customer-oriented selling and sales performance). Fig. 1 presents an overview of our conceptual framework.

As mentioned previously, both theoretical and empirical work in the area of commitment to change is rather silent on the boundary conditions that frame the effects of the focal behavior on outcome variables such as performance. To enrich our investigation, and therefore fill this gap, we draw upon Weitz's (1981) contingency framework for understanding salesperson performance. Doing so allows us to investigate the role of sales force intelligence norms, which manifest at the firm's microenvironmental level, in the effects of sales technology infusion on key outcomes. Specifically, Weitz proposes that microenvironmental characteristics function as boundary conditions that moderate the effects of salesperson behaviors, such as sales technology infusion, on outcomes. Accordingly, this study examines sales force intelligence norms as a boundary condition in the individual-level relationships between the focal salesperson behavior (i.e., sales technology infusion) and key outcomes (i.e., customer-oriented selling and sales performance). By examining the conditions that frame the effects of sales technology infusion on salesperson key outcomes, we provide a more complete picture for practitioners who, as mentioned previously, are interested in realizing performance benefits from technology implementations. We next elaborate on each construct in our framework.

2.3. Commitment to technological change

Recent developments in the extant literature on organizational commitment establish the recognition that an individual's commitment can take different forms and can be directed towards various foci (Becker, Billings, Eveleth, & Gilbert, 1996; Meyer et al., 2004). First, Meyer and Allen's (1991) three-component model – which is regarded as the most widely employed model of commitment (Meyer et al., 2002) – distinguishes among three different motives that produce three different forms of commitment: affective commitment reflecting motives of 'benefit-seeking', continuance commitment reflecting 'cost-avoiding' motives, and normative commitment reflecting 'obligation-serving' motives. An extensive body of research supports the view that dimensionality matters and demonstrates that each component of commitment may have different implications for focal behavior (e.g., Meyer et al., 2002).

Second, the acknowledgement that different foci of commitment exist refers to the fact that commitment may center on different targets within or external to an organization to which an employee is exposed like the organization, supervisor, profession, or change (Meyer et al.,

2004). To elaborate, the commitment literature suggests that one can be committed to an organization, but may not be committed to all of its initiatives and thus more micro-level analyses are warranted. Of particular interest to our study is commitment to change which has been defined as "a force (mind-set) that binds an individual to a course of action deemed necessary for the successful implementation of a change initiative" (Herscovitch & Meyer, 2002, p. 475). Inherently, commitment to change refers to a willingness and intention to support change (Herold et al., 2008).

Against this background and considering the objectives of the present study, our attention is centered on commitment directed to a specific focus — that is, commitment to technological change. In doing so, our study adheres to the principle of employing constructs that are most proximate, conceptually and operationally, with correspondingly focused attitudinal measures (Harrison, Newman, & Roth, 2006). That is, commitment to technological change is conceptually close to the focal behavior studied here: sales technology infusion. We define commitment to technological change as a mind-set that binds an individual to courses of action deemed necessary for the successful implementation of sales technology-induced change. Following developments in commitment to change theory (e.g., Herscovitch & Meyer, 2002; Solinger, Olffen, & Roe, 2008), commitment to technological change is conceptualized as a multi-dimensional construct comprising three components: affective, normative, and continuance commitment to technological change. Affective commitment to technological change (affective CTC) entails a favorable emotive disposition towards changes related to technology implementations based on a belief that such changes provide desirable benefits to the user. Normative commitment to technological change (normative CTC) reflects a sense of obligation to adapt and embrace changes in technology. Continuance commitment to technological change (continuance CTC) reflects an attitude associated with concerns about the high costs (e.g., 'high sacrifices') associated with non-compliance.

2.4. Sales technology infusion

Sales technology infusion goes beyond simple use or adoption to represent an individual's effort to effectively use technology to its fullest potential, which is well beyond initial acceptance and takes place during the post-implementation stage (Cooper & Zmud, 1990; Sundaram, Schwarz, Jones, & Chin, 2007). Once a rep adopts a technology and uses it several times, discovery of the best ways to use it should follow—that is, infusion may ensue after adoption (Zmud & Apple, 1992). Accordingly, infusion of a sales technology refers to the extent to which a salesperson seeks to use it to its full potential within an organization's operational or managerial work systems (Cooper & Zmud, 1990; Jones, Sundaram, & Wynne, 2002; Sundaram et al., 2007; Zmud & Apple, 1992). Thus, infusion represents a state of usage that occurs beyond initial use (Jones et al., 2002), emphasizing the salesperson's role in defining how best to integrate sales technology into work processes. It's worth noting here that factors which drive adoption may have the opposite effect on infusion (Cooper & Zmud, 1990). This centers management attention to the psychological underpinnings beyond initial adoption to sales technology infusion which represents the focal behavior of relevance to the target studied — that is, sales technology-induced change (Meyer & Herscovitch, 2001).

2.5. Sales force intelligence norms

Organizational norms are an integral component of organizational culture (Deshpandé, Farley, & Webster, 1993, p. 4). Specifically, norms refer to expectations about behavior or its results that are at least partially shared by a social group (Homburg & Pflesser, 2000, p. 450). Since they are visible, norms implicitly define appropriate behaviors (Schein, 1992). In other words, norms are characterized by a high degree of specificity and relevance for actual behaviors (Katz & Kahn, 1978, p. 43). Norms, therefore, guide behaviors in a specific context rather than providing general guidelines (Deshpandé et al., 1993; Schein, 1992). This aspect of norms is particularly informative for our study since here we investigate the role of sales technology-specific norms (i.e., sales force intelligence norms) in influencing the functioning of a relevant behavior — that is, sales technology infusion.

There are several factors that reinforce the argument that sales force intelligence norms play an important role in sales technology implementation. First, this logic is supported by the dominant view of modern salespeople as knowledge brokers in the extant literature (Rapp, Bachrach, Panagopoulos, & Ogilvie, 2014; Verbeke et al., 2011). Specifically, salespeople are expected to develop and share knowledge with their customers by gaining a deep understanding of their products and their applications and then transferring this knowledge to their customers (Verbeke et al., 2011). Second, within a relational context, customer-centric sales organizations increasingly focus on co-creating value with customers through the provision of customer solutions (e.g., Tuli, Kohli, & Bharadwaj, 2007). Hunter and Perreault (2007), for instance, found that two relationship-forging tasks—proposing integrative solutions and sharing market knowledge—define ways through which salespeople can use sales technologies to build better customer relationships and are driven by the use of technology to analyze and better understand information. These tasks prescribe normative behaviors and suggest two norms that are particularly salient to developing an organizational culture that propagates returns from sales technology implementations: (a) norms for analytical sales processes (e.g., Hunter & Perreault, 2007; Tuli et al., 2007) and (b) norms for knowledge sharing with customers (e.g., Hunter & Perreault, 2007; Verbeke et al., 2011). Norms for analytical sales processes refer to expectations felt by salespeople to engage in behaviors directed at analyzing customer needs. Norms for knowledge sharing with customers refer to expectations felt by salespeople to share knowledge with their customers.

2.6. Key outcomes

In relational sales environments, sales technology is implemented with a dual objective: achieving short-term, seller-centric results, such as generating a high level of sales, and long-term, customer-centric results, such as helping customers achieve their goals (Hunter & Perreault, 2007). Accordingly, we examine the influence of sales technology infusion on two key salesperson outcomes: customer-oriented selling and sales performance. Customer-oriented selling refers to the practice of the marketing concept at the level of the individual salesperson and is defined as "behavior aimed at increasing customer long-term satisfaction" (Saxe & Weitz, 1982, p. 344). Sales performance refers to the outcome results that a salesperson's selling activities generate, such as exceeding annual sales objectives or generating a high level of sales (Behrman & Perreault, 1982), and has been widely used in prior work (Cravens, Ingram, LaForge, & Young, 1993; Homburg, Müller, & Klarmann, 2011; Kohli & Jaworski, 1990).

3. Hypothesis development

3.1. Commitment to technological change and sales technology infusion

Considerable evidence supports the three-component model of commitment to change and demonstrates unique effects on focal behaviors (Herscovitch & Meyer, 2002; Meyer et al., 2002). In particular, affective commitment has been shown to affect one's focal behavior positively (Meyer et al., 2002, 2007). Commitment based on one's desire – the case with affective CTC – evoke positive compliance and may even prompt championing behaviors (Herscovitch & Meyer, 2002). That is, individuals who believe that sales technology-induced change is congruent with their own values and will deliver benefits, tend to experience stronger promotion focus, and are more intrinsically motivated to pursue the accomplishment of the goals of the new

Table 1
Consequences of commitment to change — literature review[a]: 1980–2014.

Study	Change context	Commitment to change operationalization[b]	Focal behavior(s)	Outcomes	Moderator(s)	Key findings
Baraldi, Kalyal, Berntson, Näswall, and Sverke (2010)	• Restructuring	• ACC • NCC • CCC	• Compliance • Cooperation • Championing	–	–	Commitment to change was positively related to behavioral support for change (exceptfor CCC, which was negatively related to behavioral support).
Ben-Gal and Tzafrir (2011)	• Not specified	• General commitment to change implementation	• Success of organizational change	–	–	Commitment to change has a positive effect on the successful implementation of organizational change as a whole.
Ginzberg (1981) The probability of success in implementing an information system could likely be increased if special attention were paid to gaining commitment to any changes necessitated by the new system.	• Information system		• General commitment to change	• Successful implementation	–	–
Herscovitch and Meyer (2002)	• Mergers • New technology • Modifications to shift-work • Hiring of health-care aids	• ACC • NCC • CCC	• Behavioral support for the change • Compliance • Mere compliance • Cooperation championing • Behavioral continuum	–	• Interactions among the commitment dimensions	ACC and NCC are associated with higher levels of support than is CCC. The components of commitment combine to predict behavior.
Meyer, Srinivas, Lal, and Topolnytsky (2007)	• Planned change • Restructuring	• ACC • NCC • CCC	• Behavioral support for the change • Compliance • Mere compliance • Cooperation championing • Behavioral continuum	–	• Interactions among the commitment dimensions	Considerable support for the relations between commitment and support was found.

(continued on next page)

Table 1 (*continued*)

Study	Change context	Commitment to change operationalization[b]	Focal behavior(s)	Outcomes	Moderator(s)	Key findings
Michaelis, Stegmaier, and Sonntag (2009)	• New computer software	• ACC	• Innovation implementation behavior	–	–	ACC is positively related to innovation implementation behavior.
Neves (2009)	• New performance appraisal system	• ACC	• Level of individual change	• Turnover behaviors	–	Employee's ACC fully mediated the relationship between change appropriateness and both their level of individual change and turnover intentions.
Parish, Cadwallader, and Busch (2008)	• Service process redesign • Technology	implementation	• ACC • NCC • CCC	• Individual learning • Organizational-level implementation success	• Organizational--level improved performance	–
ACC, which in turn influences employee perceptions about improved performance, implementation success, and individual learning regarding the change, had the greatest impact.						
Rafferty and Restubog (2009)	• Merger	• ACC	• Job satisfaction • Turnover intentions	• Turnover	–	ACC was positively associated with job satisfaction and negatively associated with turnover intentions, which were positively associated with voluntary turnover.
Seo et al. (2012)	• Restructuring	• ACC • NCC	• Behavioral support for change (compliance, cooperation, championing) • Behavioral resistance to change • Creative behavior for change	–	–	ACC and NCC relate positively to behavioral support for change. NCC is positively related to creative behavior for change and negatively to behavioral resistance to change.
Shin, Taylor, and Seo (2012)	• Restructuring	• ACC • NCC	• Behavioral support for change • Creative support for change	• Turnover	–	ACC and NCC were positively but differentially related to behavioral and creative support for change, and negatively related to turnover.
Sonenshein and Dholakia (2012)	• Strategic change	• ACC	• Discretionary change implementation behavior • Focal change implementation behavior	–	–	ACC is positively related to discretionary and focal change implementation behaviors.

[a] Journals included in the review: Academy of Management Journal; Academy of Management Review; Administrative Science Quarterly; British Journal of Management; Decision Sciences; Human Resource Management Journal; Industrial Marketing Management; International Journal of Management Reviews; International Journal of Research in Marketing; Journal of Applied Behavioral Sciences; Journal of Applied Psychology; Journal of Change Management; Journal of Management; Journal of Management Studies; Journal of Marketing; Journal of Marketing Research; Journal of Occupational and Organizational Psychology; Journal of Organizational Behavior; Journal of Organizational Change Management; Journal of Personal Selling & Sales Management; Journal of the Academy of Marketing Science; Management Science; Marketing Science; MIS Quarterly; Organizational Science; Personnel Psychology.

[b] ACC = affective commitment to change; NCC = normative commitment to change; CCC = continuance commitment to change.

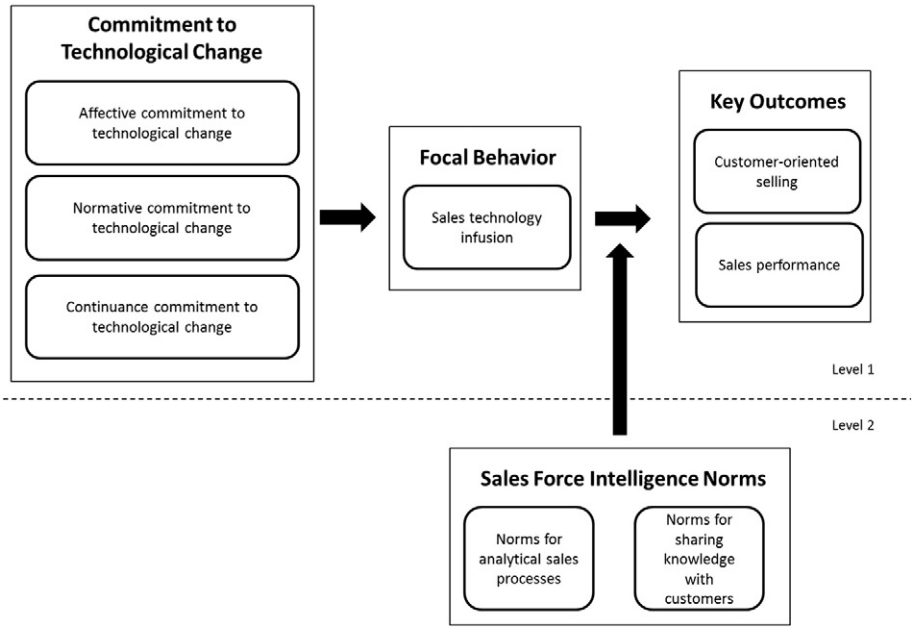

Fig. 1. Commitment to technological change, sales force intelligence norms, and key outcomes.

initiative (Luchak & Gellatly, 2007). Thus, in typically more autonomous forms of external regulation, salespeople high on affective CTC are more likely to go the extra mile and perform consistently on their tasks to support the change initiative (Meyer & Herscovitch, 2001), therefore resulting in higher levels of sales technology infusion. Accordingly, we hypothesize:

H1a. Affective CTC will be positively related to sales technology infusion.

Considerable evidence suggests that normative commitment to change affects one's focal behavior positively (Meyer et al., 2002, 2007). Theoretically, normative CTC is motivated by a perceived obligation and often parallels behaviors evoked from affective CTC (Meyer & Herscovitch, 2001). Commitment based on one's perceived obligation to use sales technology implies that infusion of a sales technology will be viewed as part of one's duties (Herscovitch & Meyer, 2002). Though not associated with affective reactions, normative CTC entails a cooperative spirit on behalf of individuals that work towards supporting the organization achieve its goals (Hill, Seo, Kang, & Taylor, 2012). That is, salespeople will use the sales technology on a regular basis and to the best of one's ability in order to help the organization realize optimal returns from that investment. Likewise, normative CTC prescribes feelings of moral obligation which are induced by the receipt of positive treatment that evoke reciprocity norms (Herscovitch & Meyer, 2002; Hill et al., 2012). This could be a perception that when the firm provides a new tool, a rep feels the need to reciprocate benefits they receive by using it. By not using a sales technology, normative CTC emotions could repudiate one's self-identity of being a 'good soldier' (Solinger et al., 2008). Accordingly, such obligation-serving emotions underlying a favorable normative CTC disposition evoke compliance behaviors leading to higher levels of sales technology infusion. Hence:

H1b. Normative CTC will be positively related to sales technology infusion.

In contrast to the previously discussed commitment components, continuance commitment has an antagonistically negative influence on focal behaviors (Meyer et al., 2002, 2007). Specifically, continuance CTC is motivated by interests in avoiding the costs of non-compliance (Meyer et al., 2004). For example, if a salesperson perceives that not using a sales technology may lead to costly sanctions such as negative performance evaluation s/he may use it to a 'bare minimum' without however reaching its fullest potential (i.e., infusion). At lower levels of continuance CTC, for instance, it is not uncommon to observe salespeople logging on to a system or keeping the device on for a certain amount of time in efforts to convince management they are using a tool as prescribed (Ahearne, Srinivasan, & Weinstein, 2004). Thus, this component of commitment inspires doing nothing more than what is necessary to avoid two non-compliance concerns: (1) 'high sacrificial' costs and (2) low or nonexistent alternatives (Herscovitch & Meyer, 2002; Meyer et al., 2007). In other words, continuance CTC reflects a utilitarian mind-set rooted in minimizing the costs of non-compliance. Hence, we expect that continuance CTC will not allow the infusion of a sales technology into a salesperson's role. Formally stated:

H1c. Continuance CTC will be negatively related to sales technology infusion.

Consistent with the traditional view in the literature (e.g., Meyer et al., 2002), the preceding discussion pinpoints that continuance commitment has monotonically negative effects on sales technology infusion. Though this expectation is valid, it does not allow for conceptualizing and testing for complex mechanisms that involve curvilinear effects. These curvilinear effects are based on more recent theoretical and empirical work in the area (e.g., Luchak, Pohler, & Gellatly, 2008; Morin, Vandenberghe, Turmel, Madore, & Maïano, 2013). Luchak and Gellatly (2007), for instance, argue that "*an assumption of linearity in the case of CC [continuance commitment] underestimates its true relations with behavioral criteria*" (p. 786) and then empirically show that continuance commitment has a U-shaped relationship with performance. Following this line of research, though we still posit that continuance CTC will negatively impact sales technology infusion at low to moderate levels, we also expect this relationship to flatten or taper off and thus level at higher levels of continuance CTC. In particular, under higher levels of continuance CTC, individuals feel high external regulation on their choices, while they experience pressure to use the sales technology, which should yield adoption of a prevention focus (Luchak & Gellatly, 2007; Meyer et al., 2004). This is because

continuance CTC is rooted in an individual's belief that not complying with organizational expectations (i.e., external regulation) would incur heavy personal sacrifices (Meyer & Allen, 1997) that – if beyond a certain level – they will become increasingly more salient for the individual thus increasing the prevention focus to maintain security and safety (Luchak & Gellatly, 2007). On this basis, it appears that the motive underlying continuance CTC stems from a fear of losing accumulated investments (i.e., side-bets), such as the job itself or autonomy associated therein (Meyer et al., 2004). At higher levels of continuance CTC, therefore, salespeople will experience a greater need to go beyond satisfying the 'bare minimum' of merely using sales technology to using it to its fullest potential in order to sustain their job and benefits. Combing these arguments with those discussed in H_{1c}, we therefore expect:

H2. At low to moderate levels, the relationship between continuance CTC and sales technology infusion will be negative; however, the relationship will be positive at higher levels of continuance CTC, thus depicting a U-shaped relationship.

3.2. Sales technology infusion and key outcomes

The theoretical links between sales technology usage and key outcomes have been established previously (Ahearne et al., 2008; Hunter & Perreault, 2007; Panagopoulos, 2010). In particular, sales technology can enhance a salesperson's ability to communicate effectively with customers and to conduct more effective analyses, thereby increasing the rep's market expertise and providing customers with better solutions (Hunter & Perreault, 2007). Moreover, sales technology can aid salespeople in accessing and retrieving relevant information about customer purchase history and preferences that they can analyze to tailor solutions and accompanying presentations to customers (Ahearne et al., 2007, 2008; Hunter & Perreault, 2007). This increased knowledge about customer needs can turn the salesperson into a trusted advisor, serving as a problem-solving hub for disseminating market knowledge to customers (Hunter & Perreault, 2007). In sum, a salesperson's capacity for diagnosing and satisfying customer needs can be enhanced using sales technology to its fullest capacity. Therefore, we anticipate that the realized benefits of sales technology infusion will positively influence customer-oriented selling.

H3a. Sales technology infusion will be positively related to a salesperson's customer-oriented selling.

Several recent studies have demonstrated that the extent of sales technology usage relates positively to various dimensions of a salesperson performance, such as behavioral, administrative, and outcome performance (Ahearne et al., 2010; Hunter & Perreault, 2007; Sundaram et al., 2007). Importantly, however, a salesperson needs to go further than frequently using the sales technology to realize such benefits. Salespeople need to use technology effectively by integrating it into their daily work (Sundaram et al., 2007). For instance, salespeople can use sales technology to minimize time spent on administrative activities (Hunter & Perreault, 2006), such as completing required reports, thereby enabling more face-to-face time with customers. An increase in the time spent on the field will result in more chances to achieve sales objectives because of increased market coverage or number of calls made to customers. Perhaps most importantly, beyond just increasing time spent on the field, sales technology enables salespeople to enhance the quality of their personal interactions with customers and thus achieve higher sales outcomes. For instance, through storing and retrieving timely data on customers, salespeople can make better presentations tailored to the needs of the customer, provide customers with better service, and adapt their presentation style to fit with the unique concerns of each customer (Ahearne et al., 2008; Hunter & Perreault, 2007). Thus,

H3b. Sales technology infusion will be positively related to a salesperson's sales performance.

3.3. Moderating effects of sales force intelligence norms

Organizational norms are behaviors accepted by most group members which vary in both their explicit nature (laws) and implicit nature (interpersonal distance) and which can reduce decisions, dependency, and power. Norms can serve as a system of control, by implicitly defining appropriate behaviors that bind members into a collective group (Ouchi, 1980). This logic, therefore, extends norms as a third party influence on individual behaviors (Thibaut & Kelley, 1986). Prior studies document the importance of organizational norms towards influencing organizational performance (e.g., Wilkins & Ouchi, 1983), information processing (e.g., Gebhardt, Carpenter, & Sherry, 2006), customer information usage (e.g., Homburg, Droll, & Totzek, 2008), and CRM use (e.g., Day, 2000). Theoretically, work in the sales domain conceptualizes and underscores the importance of intelligence, getting beyond behavior, to salesperson effectiveness (e.g., Sujan, Sujan, & Bettman, 1988; Szymanski, 1988). In this context, two salient relational norms should persist in high-intellect sales forces: norms for analytical sales processes (Hunter & Perreault, 2007; Tuli et al., 2007) and norms for sharing knowledge with customers (Flaherty & Pappas, 2009; Hunter & Perreault, 2007).

As mentioned previously, Weitz's (1981) contingency framework posits that the link of salesperson behaviors to outcomes is bounded by certain micro-environmental influences residing within the organization. Supporting this view of a contingency approach, work in the extant information technology literature suggests that performance returns from technology investments will only accrue if cultural norms encourage its usage (Cabrera, Cabrera, & Barajas, 2001; Jones et al., 2005; Leidner & Kayworth, 2006). In a sales context, salespeople respond to their expectations for analytical sales processes and for sharing knowledge with customers as components of their culture. Many salespeople voluntarily use sales technology to analyze information and to share the resulting market knowledge through mutually-beneficial solutions specific to customer needs (Hunter & Perreault, 2007). Yet, some organizations introduce sales technologies intended to monitor salesperson activities and make their use perfunctory (Tanner & Shipp, 2005). Thus, expectations (i.e., norms) of salespeople to use technology vary across organizations and tools from perfunctory to voluntary.

This variance in expectations across firms, over time, creates mental models that guide salespeople to learn more about their customers' needs (Homburg, Wieseke, & Bornemann, 2009; Homburg, Wieseke, & Kuehnl, 2009) and share this knowledge with their customers (Heide & John, 1992; Workman, Homburg, & Gruner, 1998). If using information for understanding customer needs or for sharing this knowledge with customers is not salient, salespeople will be less likely to make use of that information in their daily work routines; as such, the effects of sales technology on customer-oriented selling and sales performance will be lower. Conversely, when such norms are present, salespeople are expected to systematically access, retrieve, and analyze information about customers thereby making the most efficient use of sales technology. Infusing sales technology tools into their work processes can enhance salespeople's understanding of what customers truly value—increasing both customer-oriented selling and sales performance. When salespeople operate in a work environment in which they are expected to engage in behaviors directed at analyzing customer needs, they will tend to use sales technologies to a greater extent in order to gain considerable knowledge about customers' expectations and needs and, as such, they will be in a better position to offer solutions that satisfy customers' needs. Likewise, when salespeople experience norms for sharing knowledge with customers they tend to use tools to their fullest extent since that will enable them to better serve the

Table 2
Scale items, reliability, and validity estimates for constructs.

Scale/item	Standardized loading	α[a]	ρ[a]	Average variance extracted
Commitment to technological change [b]				
Affective commitment to technological change (ACTC)		.89	.90	.74
actc1: The CRM-related change is not necessary (R).	.92			
actc2: Things would be better without the CRM-related change (R).	.90			
actc3: I think management is making a mistake by introducing this CRM-related change (R).	.75			
Continuance commitment to technological change (CCTC)		.83	.85	.66
cctc1: I have too much at stake to resist the CRM-related change.	.94			
cctc2: It would be too costly for me to resist the CRM-related change.	.88			
cctc3: I have no choice but to go along with the CRM-related change.	.57			
Normative commitment to technological change (NCTC)		.67	.68	.42
nctc1: I do not think it would be right of me to oppose the CRM-related change.	.71			
nctc2: I feel a sense of duty to work towards the CRM-related change.	.66			
nctc3: I would feel guilty about opposing the CRM-related change.	.59			
ST infusion (STI) [b]		.80	.82	.61
st1: I am using all capabilities of the CRM system in the best fashion to help me on the job.	.89			
st2: I am using the CRM system to its fullest potential for supporting my own work.	.87			
st3: My use of the CRM system on the job has been integrated and incorporated at the highest level.	.56			
Norms for analytically-driven sales process norms (ANORM)		.77	.76	.53
an1: In our sales unit, every employee is expected to have a deep knowledge of customer needs and wants.	.84			
an2: In our sales unit, we expect that customer needs analysis processes will be continually improved.	.76			
an3: In our sales unit, we expect that information provided by reps to customers will be monitored regularly.	.58			
Norms for sharing knowledge with customers (KNORM)		.82	.82	.60
kn1: In our sales unit, every employee is expected to share his/her knowledge with customers.	.80			
kn2: In our sales unit, we expect that employees will share knowledge with customers.	.76			
kn3: In our sales unit, we appreciate employees who share knowledge with customers on new issues.	.76			
Customer-oriented selling (COS)		.87	.87	.69
cos1: I try to help the customers achieve their goals.	.87			
cos2: I try to give customers an accurate expectation of what the product will do for them.	.84			
cos3: I answer the customer's questions about products/services as correctly as I can.	.78			
Sales performance (SP)		.75	.74	.50
sp1: I am very effective in exceeding annual sales targets and objectives.	.75			
sp2: I am very effective in generating a high level of sales.	.71			
sp3: I am very effective in quickly generating sales of newly introduced products.	.65			

[a] α: Cronbach's alpha reliability estimate; ρ: Fornell and Larcker's (1981) composite reliability estimate.
[b] Participants were explicitly instructed to respond to these items by making reference to the specific sales-based CRM system that their company had implemented during the past year.

needs of their customers (i.e., be more customer oriented) and achieve sales goals. Establishing knowledge-sharing norms within the sales unit can help salespeople use technology to implement often complex cross-selling initiatives that improve their sales performance and their capacity to serve their customers better (Kamakura, Wedel, de Rosa, & Mazzon, 2003). Moreover, contemporary sales research establishes the importance of knowledge-sharing behaviors for salespeople towards building relationships with buyers (Flaherty & Pappas, 2009) — and technology use has been shown to facilitate knowledge sharing behaviors (Hunter & Perreault, 2007). Over time, such behaviors become descriptive or injunctive norms that influence salesperson activities, fostering customer oriented behaviors and helping the achievement of sales objectives. Thus:

H4. The positive relationship between sales technology infusion and customer-oriented selling will be amplified by the salesperson's perception of norms that favor behaviors that refer to (a) analytical sales processes and (b) sharing knowledge with customers.

H5. The positive relationship between sales technology infusion and sales performance will be amplified by the salesperson's perception of norms that favor behaviors that refer to (a) analytical sales processes and (b) sharing knowledge with customers.

4. Methods

4.1. Research setting & design

The population of interest includes salespeople who work in sales organizations which confront the need to continuously change (i.e., update or upgrade) their portfolios of sales technologies. Consequently, we conducted a mail-administered survey of salespeople employed in the pharmaceutical industry within a European Union country — namely, Greece. A within-industry, within-country design conducted outside the United States is well-suited because (1) pharmaceutical firms have been adaptive and often compete through continuous change initiatives driven by sales technology (e.g., Hammons & Trotta, 2013); (2) it controls for industry- and country-level heterogeneity (Grewal, Chandrashekaran, & Citrin, 2010); and (3) it allows for empirical testing of the three component model of commitment in other than US culture (e.g., Meyer et al., 2007).

Consistent with recommendations for survey research (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Rindfleisch, Malter, Ganesan, & Moorman, 2008) our design and administration sought to maximize the quality of responses obtained and mitigate the effect of common method variance (CMV) bias. Specifically, we employed a series of procedural remedies in questionnaire design and implementation. First, we used different response formats (see Table 2). Second, respondents were explicitly instructed that no right or wrong answer exists. Third, questionnaires were returned anonymously and directly to one of the researchers. Fourth, a pretesting process of the questionnaires with ten experienced key informants from the industry ensured that no ambiguous or confusing items were entered into the analysis. Finally, we counterbalanced the order of the measurement of the predictor and criterion variables to better disguise our hypotheses and reduce the potential for demand artifacts. To address any potential for CMV concern statistically, we employed a series of statistical controls to partial out any potential biasing effects (see Results section).

The survey was initially developed in English, translated in the local language (i.e., Greek) and back translated to English to ensure that the original intent of the questions was preserved through the translation process (Ittner & Larcker, 1997). Two bilingual speakers of the target

country (one of the authors and one professional translator) jointly worked on this processes. Upon ensuring translation equivalence, the survey was administered in the local language after a pretesting process with ten experienced sales executives from the pharmaceutical industry.

4.2. Sample & data collection

A list of salespeople was secured from a list broker who specialized in the targeted industry. The list included salespeople in firms that had reported implementations of new sales-based CRM software within the previous year. The one-year period helped ensure the relevant underlying attitudes were reasonably stable and that perceptions were predicated upon meaningful exposure.

Eight hundred salespeople were selected randomly from the list. Survey implementation involved mailing a packet which contained (a) a cover letter containing a description of the survey, the survey itself, and a return postage envelope to the researchers' mailing address; (b) instructions detailing anonymity to facilitate candidness; and (c) instructions that there were no right or wrong answers to the questions in the survey (Podsakoff et al., 2003).

A total of 323 questionnaires were returned, representing a response rate over 40%, which compares favorably to recent sales research (e.g., Carter, Dixon, & Moncrief, 2008). Excluding cases with excessive missing values, an effective sample size of 303 respondents resulted (effective response rate of 37.9%). Nonresponse bias was assessed through comparisons across study variables for the first and final third wave of respondents (Armstrong & Overton, 1977) yielding no evidence of statistically significant response bias. The effective sample reflected sales technology implementations in 22 firms with aggregate revenues exceeding €5.2 billion annually, and varying in size from 32 to 650 employees. About three-fourths of respondents worked for multinationals (e.g., Pfizer, Novartis, GSK, Bayer, AstraZeneca) and about half had more than 10 years of sales experience.

4.3. Measures

Where available, we adapted published scales to measure constructs (Table 2). However, our literature review indicated that none of the existing scales captured the two sales force intelligence norms (i.e., *norms for analytical sales processes* and *norms for sharing knowledge with customers*). Hence, we developed new measures for these constructs by following the procedure suggested by Churchill (1979). First, we specified the conceptual domain of the two constructs based on a comprehensive literature search. Specifically, we reviewed studies that have studied marketing norms (e.g., Homburg & Pflesser, 2000; Hunter & Perreault, 2007). Second, on the basis of our literature search, we generated an initial pool of 25 items for each construct which was refined on the basis of feedback we received from in-depth interviews with ten experienced sales executives from the focal industry. Each interview lasted between 45 and 90 min. Executives were asked to assess whether the measures covered the domain of the construct, to ascertain their interpretation of the items in the measures, and to identify any ambiguous items. On the basis of their feedback, we revised the measures. Third, we administered the final questionnaire containing the refined measures to the study's sample. Fourth, as we detail in the measurement model validation section, we conducted psychometric analysis of the scales to verify their structure, reliability and validity. This process led us to exclude two items from the sales force intelligence norms constructs because of low loadings or high cross-loadings.[2] Consequently, the new constructs were measured with three items each (Table 2 shows the final scale items).

The three components of commitment to sales technology-induced change (*affective*, *normative*, and *continuance CTC*) were measured by adapting the CTC measures of Herscovitch and Meyer (2002) which were designed to capture general commitment to change. In developing items, we were careful not to employ items with mixed polarities since prior work has cautioned researchers to their use in scale development (Herche & Engelland, 1996). In addition, since no prior study has employed Herscovitch and Meyer's scales in a sales technology-induced change context before, we used feedback we received from the in-depth interviews mentioned previously to select items that fitted our context best. This process led us to include nine items, adapted to our context, from the original CTC measures.

We adapted three items from the original scale of *sales technology infusion* (Jones et al., 2002; Sundaram et al., 2007), dropping one item due to a low factor loading.[3] We measured *customer-oriented selling* with three items from the well-established customer-oriented selling scale of Saxe and Weitz (1982). Further, consistent with our conceptualization, *sales performance* was conceptualized as the sales outcomes achieved by salespeople and was measured by adapting three items from Behrman and Perreault (1982) which have often been employed in previous studies (e.g., Cravens et al., 1993; Fang, Evans, & Zou, 2005; Sujan, Weitz, & Kumar, 1994). Though employing objective data to measure sales performance is desirable when these are available, our decision to use self-report data was driven by the following reasons. First, at the time of this study, privacy laws in the European Union restricted the release of medical information to third parties, making it nearly impossible to collect primary data from physician prescriptions. Second, performance data of salespeople from different companies are not directly comparable (Behrman & Perreault, 1982). Third, many firms are reluctant to share individual performance data and this problem continues to persist (see Homburg et al., 2011; Hunter & Perreault, 2007; Shannahan, Bush, & Shannahan, 2013). Fourth, self-reports may be particularly appropriate for modern sales settings in which salespeople often work from their homes and their primary contacts with employers are through technological interfaces (e.g., email, iPad, and iPhones). Fifth, employing self-reports for measuring sales performance when surveying across different companies is in accord with recent sales studies (e.g., Homburg et al., 2011; Johnson & Sohi, 2014; Sabnis, Chatterjee, Grewal, & Lilien, 2013; Shannahan et al., 2013). Moreover, it is likely that these self-reported measures are valid for two reasons. First, meta-analytical evidence shows that subjective measures of sales performance may be more complete than objective measures (Rich, Bommer, MacKenzie, Podsakoff, & Johnson, 1999, p. 51) and that "the size of the correlations between predictors and criteria is not inflated if self-report measures of performance are used as criteria" (Churchill, Ford, Hartley, & Walker, 1985, p. 113). Second, supervisor performance ratings may be biased by their perceptions of the salesperson's organizational citizenship behaviors (MacKenzie, Podsakoff, & Fetter, 1993). Notwithstanding these reasons, the resulting use of self-report measures potentially creates biased parameter estimates that could be attributed to CMV bias — and thus steps in both design and statistical methods were employed to help mitigate the concern.

With the exception of the three components of CTC, which were measured using a 5-point scale ("1 = Completely Disagree" to "5 = Completely Agree"), the balance of the constructs employed in this

[2] The two items are as follows: "In our sales unit, we expect that employees will be trained on ways of analyzing and satisfying customer needs" and "In our sales unit, research regarding the understanding of customer needs is expected to be conducted on a regular basis".

[3] The item dropped, "I doubt there are any better ways for me to use technology to support my work" also yielded a low standardized loading in a previous study (Sundaram et al., 2007) suggesting that this item may warrant revision in future research. The conceptual logic is that as salespeople engage in new roles that include tasks that go beyond classifying them as knowledge workers (Sheth & Sobel, 2000), it is difficult for them to ascertain with accuracy whether there are any better ways to use technology as the item implies. An example of this is the evolution of social CRM and data analytics that entail continuous experimentation with sales technologies to discover new patterns.

study were measured using a 7-point scale, anchored from "1 = Completely Disagree" to "7 = Completely Agree".

4.4. Analytical approach

Measurement model specifications employed to measure each construct are shown in Appendix A. For completeness, consistent with recent evidence demonstrating the importance of experience/tenure in driving performance in sales contexts (e.g., Rapp, Ahearne, Mathieu, & Schillewaert, 2006), model specification included salespeople's total sales experience (in years) and on the job tenure in current company (in years) as covariates.

A multi-level structural equation modeling approach was employed to test hypotheses because salespeople are nested within firms (Muthén & Muthén, 2010) and because this approach accounts for measurement error (Kline, 2011, p. 354). Defining individual salespeople as the lower-level (level-1) of our analysis, all items were measured at the lower-level of analysis, but for the norms constructs, respondents were asked to respond from the perspective of their unit (level-2). Thus, estimation of the proposed model involves variables operating at two levels: individual-level (the three components of CTC, sales technology infusion, customer-oriented selling, and sales performance) and firm-level (norms for analytical sales process and norms for sharing knowledge with customers). We employed maximum likelihood estimation and computing standard error using a sandwich estimator (Muthén & Muthén, 2010). Appendix B describes the three-step approach (Kline, 2011) we employed in estimating our multilevel model.

5. Results

5.1. Multicollinearity assessment

Multicollinearity was assessed by examining the variance inflation factors (VIF) for all independent and covariate variables. In all cases, VIF values ranged from 1.196 to 2.702—lower than the recommended cut-off value of 10 (Neter, Wasserman, & Kutner, 1990).

5.2. Measurement model validation

To establish the validity and reliability of our measures, the proposed measures were subjected to two specification tests for common method bias using the sample covariance matrix as input into Mplus 6.11. In interpreting the results of measurement analysis, we relied on Bagozzi and Yi (2012) who concluded that "*cut-off values for indicator and composite reliability might be taken with some leeway in mind. In any case, we feel that old standards for Cronbach's alpha and other formulae for reliability should not be applied rigidly to SEMs, and indeed focus should be placed more on the hypotheses under tests in, and goodness-of-fit of, any SEM*" (p. 17). To assess model fit, we used Hu and Bentler's (1999) suggested combinational rules. Specifically, an adequate fit is evidenced when (1) the standardized root mean square residual [SRMR] is less than or

Table 4
Proposed model fit statistics and parameter estimates.[a,b]

	Parameter estimates	p-Value	Results of hypotheses tests
STI			
ACTC	.08 (.08)	.346	H_{1a}: not supported
NCTC	.45 (.10)	.000***	H_{1b}: supported
CCTC	−.15 (.09)	.096*	H_{1c}: supported
Quadratic term (CCTC × CCTC)	.18 (.16)	.004***	H_2: supported
COS			
STI	.19 (.08)	.011**	H_{3a}: supported
ANORMS	.72 (.15)	.000***	Moderator-main effect
KNORMS	.16 (.14)	.248	Moderator-main effect
STI × ANORMS	−.39 (.11)	.001***	H4a: reversed
STI × KNORMS	.32 (.10)	.001***	H4b supported
OJT	−.08 (.08)	.306	Control variable
EXP	.06 (.08)	.476	Control variable
SP			
STI	.17 (.07)	.019**	H_{3b}: supported
ANORMS	.54 (.13)	.000***	Moderator-main effect
KNORMS	.07 (.12)	.545	Moderator-main effect
STI × ANORMS	−.03 (.11)	.777	H5a: not supported
STI × KNORMS	.03 (.10)	.748	H5b not supported
OJT	−.04 (.08)	.674	Control variable
EXP	.30 (.09)	.001***	Control variable
Model fit statistics			
Loglikelihood	−8308.03		
(#free parameters)	(102)		
Akaike (AIC)	16,820.06		
Bayesian (BIC)	17,198.86		
Sample-size adjusted BIC	16,875.37		

[a] Several overall fit statistics can be calculated for main effects models, but many indices are not applicable to models including nonlinear polynomial terms and subsequently are not reported here. Nonnested multilevel model specifications were compared to this baseline model after doubling the difference in the model's loglikelihood function, calculating the change in degrees of freedom, and then estimating statistical significance of the resulting model specification constraints.

[b] The coefficients are unstandardized coefficients with standard errors reported in parentheses. Notes: ACTC = affective commitment to technological change; NCTC = normative commitment to technological change; CCTC = continuance commitment to technological change; STI = sales technology infusion; ANORM = norms for analytical sales processes; KNORM = norms for sharing knowledge with customers; COS = customer-oriented selling; SP = sales performance; EXP = sales experience; OJT = on the job tenure.

* $p < .10$, one-tailed.
** $p < .05$, one-tailed.
*** $p < .01$, one-tailed.

Table 3
Correlation matrix.[a]

Variables	M	SD	1	2	3	4	5	6	7	8	9	10
1. ACTC	3.48	1.21	1.00									
2. CCTC	3.22	1.17	−.39	1.00								
3. NCTC	3.49	.85	.10	.17	1.00							
4. STI	3.71	.81	.19	.07	.32	1.00						
5. ANORM	5.67	.86	.15	.06	.11	.23	1.00					
6. KNORM	5.56	.98	.05	.15	.12	.19	.52	1.00				
7. COS	5.89	.94	.21	.04	.02	.22	.47	.41	1.00			
8. SP	5.11	.95	.01	.04	.11	.21	.42	.34	.27	1.00		
9. EXP[b]	3.58	1.17	.02	.12	−.01	.03	.03	.00	.01	.23	1.00	
10. OTJ[c]	2.86	1.21	.01	.08	−.03	.04	.018	.08	−.02	.11	.68	1.00

Notes: ACTC = affective commitment to technological change; NCTC = normative commitment to technological change; CCTC = continuance commitment to technological change; STI = sales technology infusion; ANORM = norms for analytical sales processes; KNORM = norms for sharing knowledge with customers; COS = customer-oriented selling; SP = sales performance; EXP = sales experience; OJT = on the job tenure.

[a] Pearson's correlation coefficients exceeding |.15|, |.10| are significant at the .01, and .10 levels (two-tailed), respectively.

[b] Sales experience consists of six categories that range from "less than 1 year" to "21 plus years".

[c] Job tenure consists of six categories that range from "less than 1 year" to "21 plus years".

equal to .08 and (2) either (a) the comparative fit index [CFI] is greater than or equal to .95, or (b) the root mean square error of approximation [RMSEA] is less than or equal to .05.

5.2.1. Common method variance

To partial out any systematic variance that might be attributed to CMV, an unmeasured latent method factor was specified in all measurement and structural models (Podsakoff et al., 2003). This approach attributes all systematic shared variance in the model to a common cause, thereby significantly reducing the possibility that CMV bias explains the results reported. In this study, the CMV-covariate model specification included: (a) standardizing observed measurement items as input to the sample covariance matrix, (b) scaling latent variables by constraining each latent variable's variance to unity, and (c) specifying uncorrelated interrelationships between proposed latent constructs and the CMV factor. This CMV-covariate model indicates an adequate fit: $\chi^2_{(224)} = 313.62$, $p < .001$; CFI = .97; RMSEA = .036; 90% CI for RMSEA = (.026; .045), and SRMR = .04. Comparison of fit between the proposed measurement model and the CMV-covariate included model indicates a statistically improved fit. This suggests partialling out common method variance, which was done in this analysis.

To attribute shared variance associated with a CMV factor more appropriately, our model specification included four additional latent variable constructs (with acceptable reliabilities taken from the same survey, but not relevant to this paper) to the previous CMV-covariate model specification. Theoretically, the shared variance among the additional four constructs and this study's constructs would also be shared with the CMV-covariate. Thus, the subsequent use of latent variable scores provides unbiased inputs in lieu of raw data making them appropriate for the analysis of interactions among latent variables (Jöreskog & Yang, 2000). Results indicated an adequate fit for this CMV-inclusive model: $\chi^2_{(492)} = 593.44$, $p < .001$; CFI = .98; RMSEA = .026; 90% CI for RMSEA = (.017; .033), and SRMR = .04. Factor scores for path loading from this model were then used to fit subsequent measurement and structural models. Results from the CFA indicate an adequate fit as overall fit statistics for CFA measurement model were: $\chi^2_{(224)} = 313.62$, $p < .001$; CFI = .97; RMSEA = .036; 90% CI for RMSEA = (.026; .045), and SRMR = .04.

Overall, the procedures employed herein help alleviate concerns for CMV. Moreover, as the results of our study include statistically significant interaction and quadratic terms along with an array of positive and negative effects among constructs, it's unlikely that the results reported here are heavily influenced by method bias (Evans, 1985).

5.2.2. Validity and reliability

In light of the recommendations by Bagozzi and Yi (2012) mentioned previously, CFA results provide evidence of the convergent and discriminant validity of the proposed measures. Moreover, as shown in Table 2, all factor loadings are highly significant ($p < .001$), composite reliability for each construct is greater than .68, and average variance extracted (AVE) estimates are greater than .50 (Fornell & Larcker, 1981). The only exception was normative commitment (AVE = .42); however, this value is greater than its highest shared variance with any other construct in the study (i.e., .12; see Table 3). Accompanied by significant loadings, the measure possesses adequate discriminant and convergent validity. Additionally, while no absolutes for item reliabilities exist (Bagozzi & Yi, 2012), conventionally, standardized loadings lower than .45 suggest that an item may not be a reliable measure of its intended construct (Hunter & Perreault, 2007); all items surpass that guideline. Finally, exceeding Fornell and Larcker's (1981) criterion, the highest shared variance between all possible pairs of constructs is lower than the AVE for the individual constructs, further supporting discriminant validity. Face validity was assessed by comparison of items with construct definitions. In sum, constructs and items demonstrate adequate reliability and validity and method variance was partialled out prior to estimating models.

5.3. Multi-level structural equation model

Table 4 summarizes the parameter estimates for the multilevel model. Consistent with expectations in H_{1b} and H_{1c}, respectively, results indicate that normative CTC positively influenced sales technology infusion ($\gamma = .45$, $p < .01$), while continuance CTC had a negative influence ($\gamma = -.15$, $p < .05$). On the other hand, affective CTC does not exert a significant influence on technology infusion ($\gamma = .08$, $p = .346$); thus, H_{1a} did not receive support. Additionally, regarding the proposed quadratic effect of continuance CTC (H_2), the results support the hypothesized U-shaped effect of continuance CTC on technology infusion ($\gamma = .18$, $p < .01$). Fig. 2 provides a pictorial depiction of this quadratic effect.

Concerning the proposed main effects of technology infusion on customer-oriented selling, technology infusion ($\beta = .19$, $p < .01$) demonstrated significant effects consistent with H_{3a}. The proposed moderating effect of knowledge sharing norms in the relationship between sales technology infusion and customer-oriented selling was supported (H4b: $\gamma = .32$, $p < .01$), as it was the proposed moderating effect for analytical sales processes norms but in the opposite direction hypothesized (H4a: $\gamma = -.39$, $p < .01$). Fig. 2 depicts these moderating effects.

With respect to the main effects of sales technology infusion on sales performance, again, technology infusion (H_{3b}: $\beta = .17$, $p < .01$) demonstrated expected effects. Finally, neither analytical sales norms (H5a: $\gamma = -.03$, $p = .777$) nor knowledge sharing norms (H5b: $\gamma = .03$, $p = .748$) were found to moderate the relationship between sales technology infusion and sales performance.

5.4. Additional analyses

Empirical tests for arguably reasonable multiplicative, curvilinear, and mediating effects were conducted. First, interaction effects among the three types of commitment to technological change and sales technology infusion were assessed using hierarchical moderated regression analysis. To reduce multicollinearity, all variables were group (firm) mean-centered—entering main-effects in the first step and the three two-way interaction terms in the second. Results indicated no significant interactions ($p < .05$) between the types of commitment.

Second, given that an inverted U-shaped relationship between sales technology usage and performance has been documented in prior research (Ahearne et al., 2004), two regression specifications including regressing the dependent variables on the proposed independents and a quadratic transformation of sales technology infusion were tested. Two-tailed tests of the quadratic terms indicated they were not statistically significant ($p < .05$) evidencing that neither a U-shaped nor inverted U-shaped relationship between sales technology infusion and the key outcomes are present in this sample.

Third, consistent with the structural equation modeling approach (Bollen, 1989), our conceptual framework proposes direct and indirect effects and includes several zero-constrained relationships (e.g., where no path is specified between latent constructs) in assessing overall fit. Recent work suggests that an effect to be mediated is not a meaningful requirement evidencing mediation in structural equation models (e.g., Judd & Kenny, 2010; Zhao, Lynch, & Chen, 2010). One can estimate total effects by summing the statistically significant direct and indirect effects, which are modeled as product terms (Bollen, 1989). When the direct effect of an exogenous variable on an endogenous variable is not statistically significant in the hypothesized model (e.g., zero-constrained relationships that in estimation are not significantly different from zero), the total effect is simply the product of the statistically significant indirect effects. In essence, our model specifies single- and double-mediated indirect effects, but it is important to emphasize that we are not proposing a saturated model. Rather, the model explicitly constrains six direct effect relationships between constructs to zero (two between each component of CTC and the two key outcomes) — and tests each of these constraints in addition to testing the cumulative

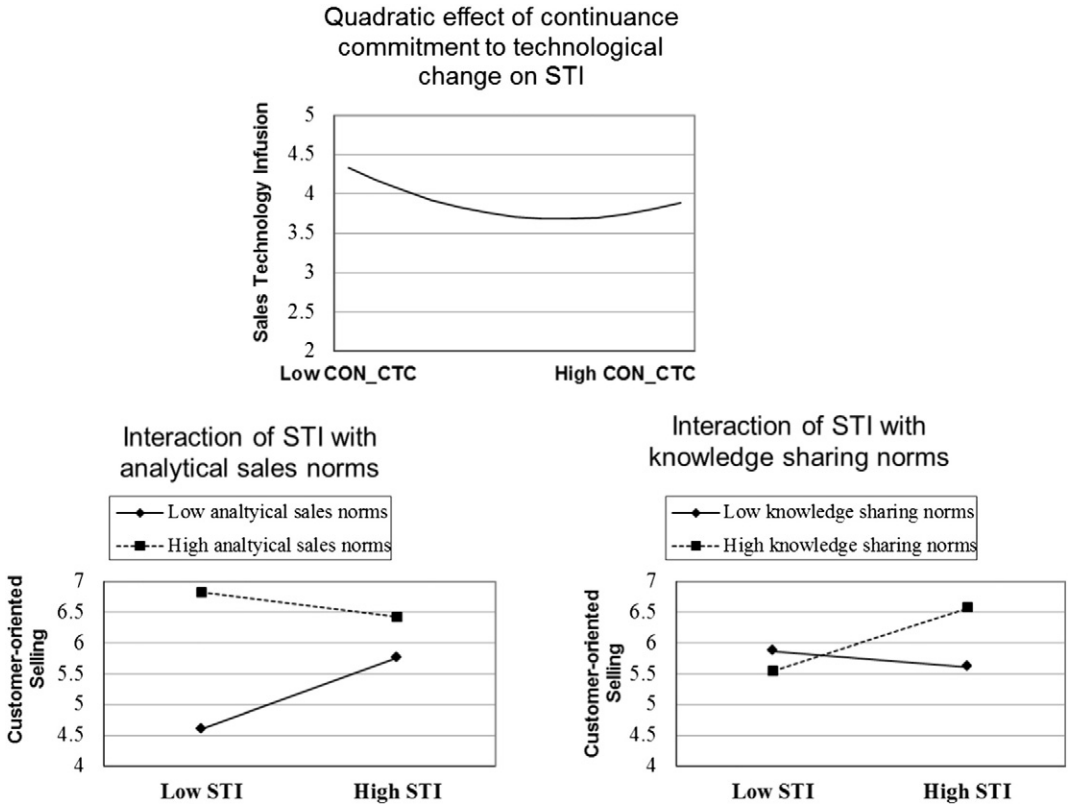

Fig. 2. Plots of statistically significant nonlinear effects: quadratics and interactions.

effects in assessments of overall model fit. All direct effects were found to be non-significant at cutoffs suggested by Sörbom (1989). Thus, the total effects of the components of CTC on the key outcomes are represented by the products of their statistically significant effects through sales technology infusion. Using the mediation classification scheme proposed by Zhao et al. (2010), we therefore conclude that the effects of affective CTC on either key outcome are not mediated by sales technology infusion. In fact, the total effect of affective CTC in the model is not significant. Concerning normative CTC, its effects on the key outcomes are indirect only; thus, sales technology infusion fully mediates the effects of normative CTC on both customer-oriented selling and sales performance. Its total standardized effects are .09 on customer-oriented selling and .08 on sales performance. Finally, continuance CTC has statistically significant effects through both its linear and quadratic terms thus, again, providing evidence that sales technology infusion fully mediates its effects on the key outcomes.

6. Discussion

Firms spend billions annually on sales technologies because they constitute a necessary condition for implementing key business initiatives such as big data or predictive analytics. However, many technology implementations fail in that salespeople do not get to infuse these technologies into their work processes whereas realized returns may be lower than expected. As proposed and found here, some of the fault may be attributed to attitudinal dispositions in the form of different components of commitment towards technological change as well as the role played by sales force intelligence norms. The present study also focuses on how sales technology infusion and sales force intelligence norms influence two key outcomes: customer-oriented selling – which focuses on longer term relationship-building – and sales performance, conceptualized here as the achievement of shorter-term sales objectives. We believe that our study contributes to the sales and commitment to change literature streams in at least three important ways.

6.1. Research implications

First, prior research on the drivers of successful sales technology implementation has not paid much attention to why salespeople commit to the change being introduced by sales technology tools. This is disconcerting given that change is an inevitable attribute of sales technology introduction that alters salespeople's critical perceptions and attitudes (Ahearne et al., 2010). Our study sheds lights on this topic by showing that taking a three-component approach to studying commitment to sales technology-induced change matters in that it helps explain salespeople's decision to infuse the technology into their job. Further, our study contributes new insights into the complex nuances of commitment to technological change by presenting evidence for curvilinear effects (i.e., continuance CTC) which have not been the focus of much research to date (see Finegan, 2000; Meyer et al., 1998). Notably, our study also contributes to the wider marketing literature by departing from the single or two-dimensional conceptualizations of commitment that have been the central focus of previous research (e.g., Morgan & Hunt, 1994) to a more fine-grained approach of studying commitment to sales technology-induced change that comprises three different components.

Specifically, our study reveals an intriguing pattern of effects stemming from different components of commitment to sales technology change. Our results confirm the theoretical prediction that normative CTC positively influences infusion — in fact, this effect is the strongest among all three effects. This finding indicates that salespeople whose

nature of commitment to technological change is better characterized as obligation-serving are more likely to use sales technology tools to their fullest. This finding is in line with findings in the extant literature which show that normative commitment to change is systematically (and positively) related to favorable focal behaviors (e.g., Herscovitch & Meyer, 2002; see Table 1).

Consistent with our expectations, continuance CTC exhibited a negative influence on sales technology infusion, a finding which highlights that cost-avoiding commitment, at least at lower levels, may hurt implementation. Interestingly, at higher levels of continuance CTC, the statistically significant, positive quadratic effect indicates that cost-avoiding commitment may amplify returns on technology infusion insofar as the costs associated with not supporting the technological change may be too high for salespeople to ignore. We believe that these new insights pertaining to the effects of continuance CTC are interesting, especially when considering that this component of CTC has been studied rather rarely in prior work (see Table 1). Furthermore, an interesting addition to the extant literature is that the significant effects of normative and continuance commitment operate rather independently, since their interaction was not found to be significant.

Interestingly, though normative and continuance CTC are found to significantly (and independently) impact on technology infusion, our analyses show that the effect of affective CTC on infusion is non-significant. Our mediation analyses reveal that, in fact, affective CTC exerts no influence in the model. This contrasts with prior work where it has been found that affective commitment to change is consistently related to the focal change behavior (e.g., Meyer et al., 2007; Michaelis et al., 2009; see Table 1). It looks like that salespeople's emotional bond to or desire for the technological change may not be an important predictor of technology infusion, perhaps because of the very nature of this component of commitment which is based on affect and which might not be a particularly strong binding force for salespeople in a sales technology context. Another plausible explanation is that the focal behavior studied here is sales technology infusion, which refers to the extent to which a salesperson seeks to use a technology to its fullest potential, as opposed to simply using or adopting it (Jones et al., 2002; Sundaram et al., 2007). Consistent with Cooper and Zmud (1990) who show that factors which drive adoption may have the opposite effect on infusion, it is possible that explaining a salesperson's effort in finding how best to integrate the technology into work processes takes more than just a favorable emotive disposition towards change. In this respect, the finding that normative and continuance, but not affective, binding forces influence infusion is a core contribution of this article in that it highlights that utilitarian motives-rather than just a desire to support-spur salespeople to get the most out of sales technologies.

Second, with respect to attaining returns from higher levels of sales technology infusion, our study suggests that infusion does lead to improvements in salesperson key outcomes. Specifically, there is a main (positive) effect of sales technology infusion on both customer-oriented selling and sales performance. Whereas the study by Sundaram et al. (2007) shows that infusion leads to increases in sales performance, our study suggests that infusion also increases customer-oriented selling, thereby offering evidence that sales technology does not only improves short-term outcomes but also longer-term aspects of a salesperson's job such as building better customer relationships. In addition, our non-linear analyses show that these effects are continuously positive suggesting that for firms to get the most out of a sales technology, infusion (not just mere usage) needs to be at the highest possible level. Gaining a better understanding of how the focal behavior (i.e., sales technology infusion) impacts key outcomes is deemed as an important contribution in light of the fact that prior work has not paid much attention to these linkages (see Table 1). In this respect, our study adds to the extant commitment to change literature besides contributing to the sales stream of research.

Third, focusing our study on the moderating role of firm-level, sales force intelligence norms in realizing benefits from sales technology implementation contributes to the body of work by shedding light to some important, yet unexplored boundary conditions. Because modern salespeople are knowledge brokers (Rapp et al., 2014; Verbeke et al., 2011) that need to develop and share knowledge with customers, companies are increasingly interested in fostering a culture of analytically-driven, technology-dependent sales processes. As such, exploring the role of sales force intelligence norms represents an important addition to the extant sales literature. However, our contribution extends beyond the marketing field in that, as discussed previously and as shown in Table 1, knowledge on how factors from the wider micro/macro-environment moderate the consequences of commitment to change is surprisingly sparse. Previous scholars have examined the consequences of a focal change behavior, predominantly by focusing on turnover (e.g., Rafferty & Restubog, 2009; Shin et al., 2012), but our perspective extends this work by showing that the consequences of focal change behaviors, which may include additional key outcomes such as performance, are bounded by certain microenvironmental conditions.

Specifically, sales force intelligence norms moderate the relationship between sales technology infusion and customer-oriented selling, demonstrating the importance of including these constructs in contemporary research. Specifically, the patterns of significant moderating effects of the two sales force intelligence norms are more apparent from the plots provided in Fig. 2. First, we observe that higher levels of norms for analytical sales processes are consistent with higher levels of customer-oriented selling, irrespective of the level of sales technology infusion. However, interestingly, in contrast to our expectations, the slope for high analytical sales process is negative, supporting the notion that the positive impact of infusion on customer-oriented selling decreases at higher levels of norms for analytical sales processes. Conversely, the slope at lower levels of norms for analytical sales processes is more severe—and positive—indicating that firms with low levels of analytical norms may, in fact, gain significant returns on customer-oriented selling from inducing higher levels of sales technology infusion. It is perhaps the nature of this aspect of sales force norms that explains this result. Specifically, under higher levels of norms for analytical sales processes, salespeople expect that their customer needs analysis and exchange of information is monitored regularly and is subject to continuous improvement. As such, salespeople may view these expectations as a forceful micromanagement tool that leaves no room for working out individualized approaches to discovering and satisfying customer needs; rather, they feel that customer-oriented selling is something that has to develop and evolve through standard analytical processes, which are linked to the use of a sales technology.

Whereas norms for sharing knowledge with customers were not found to influence customer-oriented selling directly, they were found to exert a significant, positive moderating effect. In particular, in sales cultures characterized by high knowledge sharing with customers norms, there are significant returns on customer-oriented selling from inducing sales technology infusion. Conversely, in low knowledge sharing cultures, higher levels of sales technology infusion reduce returns on customer-oriented selling. Put differently, if sharing knowledge with customers is already the norm in a company then sales technology will be viewed as a tool that facilitates such sharing of knowledge; in contrast, extensive use of technology does not fit well with norms that hinder sharing knowledge (as described by lower levels of norms for sharing knowledge) because fear or simply skepticism of providing tacit knowledge is further amplified by the easiness with which knowledge can be shared through sales technology.

The preceding discussion highlights that the moderating effect of sharing knowledge norms operates quite differently than the moderating effect of norms for analytical sales processes. Whereas the first type of norms exerts a positive moderating effect on the relationship between sales technology infusion and customer-oriented selling, the latter type of norms exerts a negative moderating effect. It is possible that the differential effects of the two types of norms with regard to

customer-oriented selling emanate from their different nature. Specifically, whereas norms for analytical sales processes refer to what salespeople are expected to do with sales technology *inside* the organization (e.g., improving processes for analyzing customer information), norms for sharing knowledge with customers refer to what salespeople are expected to do with regard to using sales technology *outside* of the organization at the customer interface (e.g., the organization appreciates and expects salespeople that are sharing their knowledge with their customers). Thus, the manner in which knowledge sharing norms function appears to be in congruence with the very nature of customer-oriented selling which, by definition, occurs at the customer interface and is directed externally towards the customer rather than internally towards the organization (Plouffe, Hulland, & Wachner, 2009; Saxe & Weitz, 1982). We believe that such trade-offs between different aspects of sales force intelligence norms are interesting and reveal that gains in customer-oriented selling, as a result of using sales technologies to their fullest extent, are realized through complex mechanisms such as those described herein and which have not yet received attention in the extant sales literature.

Furthermore, despite the fact that norms for analytical sales processes were found to directly (and positively) influence a salesperson's sales performance, technology infusion's influence on achieving sales performance is not moderated (increased or decreased) at different levels of either of the sales force intelligence norms developed herein: analytical sales processes' or sharing knowledge with customers' norms.

One perspective on this result is that one might accept that the usage of 'sales technology', as measured in this study, served primarily as a facilitator and not as an enabler of specific sales behaviors that could not otherwise be performed without the use of sales technology. Thus, for example, the more advanced a company is in analyzing information, such as customer insights, the less it might require technologies for "facilitating" sales tasks. In particular, many such facilitating sales technologies mandate a very standardized approach for analysis; a more standardized approach, that is, in comparison to that of an analytically-skilled salesperson who might have already established her own approach to conduct analytical processes that were better tailored to her account's needs. In such cases, implementing the new, more standardized approach associated with using a facilitating-type sales technology might even result in less tailored, or less customer-centric, sales solutions than those afforded through the more idiosyncratic sales analysis the new technology displaced. On the contrary, if a company was rather weak with respect to employing idiosyncratic analytical sales approaches, it might gain significantly from the newly adopted standardized approaches that come along the new sales technologies. This logic is consistent with this study's empirical results. Moreover, it is consistent with the logic that much better insight may be afforded from employing more disaggregated measures to better understand how salespeople are using technology—as it is evident that how technology is used matters. This logic reinforces the view in the extant literature that "different uses of technology have differential effects on various aspects of (sales) performance" (Hunter & Perreault, 2007, p. 30). As an important note for future research, combining such disaggregated constructs and measures with the specificity in focal behaviors, proposed herein, as inputs to more conceptually-rigorous hypothesis developments may be requirements for achieving adequate model fit statistics from the demanding constraints associated with testing more analytically-sophisticated model specifications, such as the one tested herein.

There might be other, more utilitarian reasons, however, such as using a technology to its fullest potential because one has to come with useful solutions for pressing customer problems rather than relying on the expectations for usage in the sales organization. Yet another explanation may be related to how we, and other researchers, currently operationalize sales technology use or infusion. That is, in lieu of the current practice of using an aggregate measure of sales technology use, would a measure with more specificity (e.g., for accessing, analyzing, or communicating information) yield the moderating effects hypothesized herein? This finding and query is relevant to a number of studies incorporating an aggregate use measure of sales technology and may reinforce previous research which found that how a salesperson uses technology matters (Hunter & Perreault, 2007).

6.2. Managerial implications

This research informs practice in several ways. First, it is clear that different components of CTC exhibit differential effects on sales technology infusion. Thus, while "committing" salespeople to the use of a sales technology is and should be an overriding objective among managers implementing a sales technology, our findings show that managing commitment without taking into account that different types of commitment exist is a rather narrow-minded approach. Specifically, results of the study suggest that managers should monitor and make interventions on different components of CTC throughout the implementation process. For example, although getting salespeople to feel an emotional attachment to the technological change appears a worthwhile objective, our study shows that affective CTC might not be a particularly effective motivator, at least in the sample of companies examined here. The results indicate that to enhance sales technology infusion, managers should primarily seek to motivate higher levels of normative CTC. Given the definition of normative CTC and the way the construct was operationalized here, increasing normative CTC might, for instance, imply that managers clearly communicate that sales technology is a part of salespeople's role duties thus fostering feelings of obligation into using a sales technology. Or practicing managers may want to place emphasis on communicating cases of prior positive treatment by the organization since that would instill a sense of moral obligation to support or feeling of guilt about opposing the technological change. These feelings of obligation may act as powerful motivators in getting salespeople to work towards supporting the organization's initiatives.

Second, concerning continuance CTC, if it is fostered at all, it's effective at driving sales technology infusion only at higher levels (e.g., levels at which the salesperson fears loss of his/her job or other privileges). Thus, prima facie, it seems that fostering high levels of feelings of "perceived costs" from not supporting the technological change can and will result in higher levels of technology infusion into one's work routines. This is good news for managers in that it allows them to acknowledge the different sources of motivation that may underlie a sales technology implementation. That said, it should be underlined that if such interventions fail to bring up high levels of perceived costs, then at low levels, these perceptions will have deleterious effects on sales technology infusion. Moreover, we caution managers that such high levels of a fear-induced commitment to technological change might trigger a myriad of other management concerns, which, while not examined here, are plausible (e.g., high turnover among high performing salespeople). All in all, managers need to carefully think whether normative or continuance (or both) is desirable and fits the company context.

Third, firms implement sales technologies with the expectation that high levels of usage will yield returns on key outcomes. Our results reinforce this view by providing evidence that sales technology infusion positively influences both customer-oriented selling and sales performance. As such, working towards making salespeople use a sales technology to its fullest extent is a worthwhile goal.

Finally, this study demonstrates that at least one type of the sales force intelligence norms examined here (i.e., norms for analytical sales processes) can play a vital role in directly impacting both customer-oriented selling and sales performance. In an era marked by salespeople who serve as knowledge brokers (Verbeke et al., 2011; Rapp et al., 2014), analytical norms represent a critical component of an effective sales culture. Thus, sales organizations realize returns from fostering cultures with analytical selling overtones that are independent of returns from sales technology infusion. Managers can induce such expectations by making the process for analyzing and discovering

customer needs a systematic procedure which is subject to continuous improvement and regular monitoring. Although these direct effects are desirable, it is emphasized here that norms for analytical sales processes may, however, interact negatively with sales technology infusion thus resulting in lower levels of customer-oriented selling. In other words, whenever the goal is to use sales technology to its fullest potential in order to increase customer-oriented selling, managers need to carefully manage the norms for analytical sales processes because too high levels of these norms can adversely influence customer-oriented selling. However, fostering a culture high on norms for knowledge sharing with customers will eventually strengthen the effect of sales technology infusion on the development of salespeople's customer-oriented selling. It is therefore imperative that managers pay close attention to the trade-offs involved in fostering high levels of different norms associated with sales technology.

6.3. Study limitations & future research

Our results are tempered by certain limitations. First, while focusing on a single industry allows controlling for industry-level heterogeneity, thus maximizing internal validity, future research needs to replicate our findings in other contexts. Second, the field survey design employed here makes drawing causal inferences tenuous compared to longitudinal and controlled lab experiments. Specifically, research directed at studying the introduction of sales technology as it unfolds over time would contribute to current knowledge in important ways. This might require departure from a quantitative/deductive research approach towards adopting a qualitative/inductive one, such as grounded theory or discovery-oriented approach. Such approaches allow for a more fine-grained picture of the phenomenon to be captured. Specifically, questions such as "how technology is actually utilized from salespeople to increase their learning capabilities," "in what ways are customer value and customer relationships enhanced through technology usage" represent opportunities associated with such future studies. Third, in spite of the various procedural and statistical remedies employed to mitigate concerns over CMV, our procedures are not immune. Thus, future research should employ objective performance data to validate our results. Fourth, though research has shown that commitment effects generalize across cultures (Meyer et al., 2007), our sample is limited to salespeople in the country examined; thus future research should examine whether our model generalizes to other cultures. Fifth, some of our measures, like sales force intelligence norms, are new to the sales domain; thus, future research needs to validate and improve their measurement properties. Finally, it would be fruitful for future research to examine the antecedents of the components of CTC to identify ways that companies can enact to ensure a smooth technology implementation.

7. Conclusion

This study contributes important insights on how a salesperson's CTC influences her infusion of sales technology into sales processes, and, in turn, how both sales technology infusion and sales force intelligence norms influence returns from key outcomes: customer-oriented selling and sales performance. It is the first study to propose and test the effects of different components of CTC (affective, normative, and continuance) — and to outline how those effects yield return in vital contemporary sales contexts. Moreover, it is the first study to propose sales force intelligence norms—and to develop hypotheses on how those norms drive key outcomes, as well as how norms interact with an integral focal sales behavior — namely, sales technology infusion. Our findings demonstrate the relevance and importance of these constructs to contemporary selling. While providing useful implications for both managers and academics, as the first study of its kind on the components of CTC and sales force intelligence norms, it marks only the beginning of contributions sales scholars can make to helping managers address one of the most daunting and expensive aspects confronting them today—the continuous and seemingly never-ending implementation of new sales technology tools.

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Appendix A. Measurement specification[4]

A conventional scaling practice, fixing the variance of the latent variable to unity, was employed to achieve model identification. Latent variables are shown in uppercase letters, while observed variables are shown in lowercase. Specifications for measurement model employed group mean centering. The general form is: $\mathbf{Y_{ij}} = \beta_{0j} + \beta_{1j}\,\mathbf{X_1} + \ldots + \beta_{1j}\,\mathbf{X_q} + r_{ij,}$ for q indicators, where $r_{ij} \sim N(0, \sigma^2)$. Group mean centering was not employed for the single-item measures representing the study's covariates. Specifically, the following specifications were used:

$$\mathbf{ACTC}_{ij} = \beta_{0j} + \beta_{1j}(actc1_{ij} - actc1_{\bullet j}) + \beta_{2j}(actc2_{ij} - actc2_{\bullet j}) + \beta_{3j}(actc3_{ij} - actc3_{\bullet j}) + r_{ij} \quad (A.1)$$

$$\mathbf{NCTC}_{ij} = \beta_{0j} + \beta_{1j}(nctc1_{ij} - nctc1_{\bullet j}) + \beta_{2j}(nctc2_{ij} - nctc2_{\bullet j}) + \beta_{3j}(nctc3_{ij} - nctc3_{\bullet j}) + r_{ij} \quad (A.2)$$

$$\mathbf{CCTC}_{ij} = \beta_{0j} + \beta_{1j}(cctc1_{ij} - cctc1_{\bullet j}) + \beta_{2j}(cctc2_{ij} - cctc2_{\bullet j}) + \beta_{3j}(cctc3_{ij} - cctc3_{\bullet j}) + r_{ij} \quad (A.3)$$

$$\mathbf{STI}_{ij} = \beta_{0j} + \beta_{1j}(st1_{ij} - st1_{\bullet j}) + \beta_{2j}(st2_{ij} - st2_{\bullet j}) + \beta_{3j}(st3_{ij} - st3_{\bullet j}) + r_{ij} \quad (A.4)$$

$$\mathbf{ANORM}_{ij} = \beta_{0j} + \beta_{1j}(an1_{ij} - an1_{\bullet j}) + \beta_{2j}(an2_{ij} - an2_{\bullet j}) + \beta_{3j}(an3_{ij} - an3_{\bullet j}) + r_{ij} \quad (A.5)$$

$$\mathbf{KNORM}_{ij} = \beta_{0j} + \beta_{1j}(kn1_{ij} - kn1_{\bullet j}) + \beta_{2j}(kn2_{ij} - kn2_{\bullet j}) + \beta_{3j}(kn3_{ij} - kn3_{\bullet j}) + r_{ij} \quad (A.6)$$

$$\mathbf{COS}_{ij} = \beta_{0j} + \beta_{1j}(cos1_{ij} - cos1_{\bullet j}) + \beta_{2j}(cos2_{ij} - cos2_{\bullet j}) + \beta_{3j}(cos3_{ij} - cos3_{\bullet j}) + r_{ij} \quad (A.7)$$

$$\mathbf{SP}_{ij} = \beta_{0j} + \beta_{1j}(sp1_{ij} - sp1_{\bullet j}) + \beta_{2j}(sp2_{ij} - sp2_{\bullet j}) + \beta_{3j}(sp3_{ij} - sp3_{\bullet j}) + r_{ij} \quad (A.8)$$

$$\mathbf{EXP}_{ij} = \beta_{0j} + \beta_{1j}(exp1_{ij}) + r_{ij} \quad (A.9)$$

$$\mathbf{OJT}_{ij} = \beta_{0j} + \beta_{1j}(ojt1_{ij}) + r_{ij} \quad (A.10)$$

Appendix B. Multilevel structural equation model specification[5]

A conventional scaling practice, fixing the variance of the latent variable to unity, was employed to achieve model identification The first step in the multilevel structural equation modeling approach involves calculation of the unconditional intraclass correlation coefficient for

[4] Notes: ACTC = affective commitment to technological change; NCTC = normative commitment to technological change; CCTC = continuance commitment to technological change; STI = sales technology infusion; ANORM = norms for analytical sales processes; KNORM = norms for sharing knowledge with customers; COS = customer-oriented selling; SP = sales performance; EXP = sales experience; OJT = on the job tenure.

[5] Notes: ACTC = affective commitment to technological change; NCTC = normative commitment to technological change; CCTC = continuance commitment to technological change; STI = sales technology infusion; ANORM = norms for analytical sales processes; KNORM = norms for sharing knowledge with customers; COS = customer-oriented selling; SP = sales performance; EXP = sales experience; OJT = on the job tenure.

the endogenous variables. To test the significance level of between-groups variance in criterion variables of the Level 2 residual variance of the intercept (τ_{00}), no predictors were specified for either the Level 1 or Level 2 equations. The general specification for the random effects ANOVA model follows:

$$\textit{Level 1 (within group variation)}: Y_{ij} = \beta_{0j} + r_{ij}, \quad \text{where } r_{ij} \sim N(0, \sigma^2) \tag{B.1}$$

$$\textit{Level 2 (between group variation)}: \beta_{0j} = \gamma_{00} + U_{0j} \quad \text{where } U_{0j} \sim N(0, \tau_{00}) \tag{B.2}$$

$$\textit{Reduced form equation}: Y_{ij} = \gamma_{00} + U_{0j} + r_{ij} \tag{B.3}$$

where, Y_{ij} represents the endogenous variables (sales technology infusion, customer-oriented selling, and sales performance) measured at individual-level for person i in firm j; β_{0j} is the intercept value for firm j; γ_{00} is the intercept value for firm level variable; r_{ij} is the within-group random individual error, and U_{0j} is the between-group level residual. The second step involves estimation of the within variation (Level 1 model) which ignores the clustering effect with the goal of distinguishing specification error at either level. In the third step both the between and within models are estimated simultaneously. The following random intercepts model was specified to test the hypothesized relationships:

Level 1 (within-firm variation):

$$\mathbf{STI}_{ij} = \beta_{0j} + \beta_{1j}(\mathrm{ACTC}_{ij}) + \beta_{2j}(\mathrm{CCTC}_{ij}) + \beta_{3j}(\mathrm{NCTC}_{ij}) + \beta_{4j}\left(\mathrm{CCTC}^2{}_{ij}\right) + \beta_{5j}(\mathrm{EXP}_{ij}) + \mathrm{rst}_{ij} \tag{B.4}$$

$$\mathbf{COS}_{ij} = \beta_{0\mathrm{COS}j} + \beta_{6j}(\mathrm{STI}_{ij}) + \beta_{7j}(\mathrm{ANORM}_{ij}) + \beta_{8j}(\mathrm{KNORM}_{ij}) + \beta_{9j}(\mathrm{STI}_{ij} \times \mathrm{ANORM}_{ij}) + \beta_{10j}(\mathrm{STI}_{ij} \times \mathrm{KNORM}_{ij}) + \beta_{11j}\left(\mathrm{OJT}_{ij}\right) + \beta_{12j}(\mathrm{EXP}_{ij}) + \mathrm{rcos}_{ij} \tag{B.5}$$

$$\mathbf{SP}_{ij} = \beta_{0\mathrm{SP}j} + \beta_{13j}(\mathrm{STI}_{ij}) + \beta_{14j}(\mathrm{ANORM}_{ij}) + \beta_{15j}(\mathrm{KNORM}_{ij}) + \beta_{16j}(\mathrm{STI}_{ij} \times \mathrm{ANORM}_{ij}) + \beta_{17j}(\mathrm{STI}_{ij} \times \mathrm{KNORM}_{ij}) + \beta_{18j}\left(\mathrm{OJT}_{ij}\right) + \beta_{19j}(\mathrm{EXP}_{ij}) + \mathrm{rsp}_{ij} \tag{B.6}$$

Level 2 (Between-firm variation):

$$\beta_{0j} = \gamma_{0\mathrm{STI}} + U_{01j}; \quad \beta_{0\mathrm{COS},j} = \gamma_{\mathrm{COS}} + U_{1j}, \quad \text{and } \beta_{0\mathrm{SP},j} = \gamma_{\mathrm{SP}} + U_{2j}. \tag{B.7}$$

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Gary K. Hunter is an Associate Professor of Marketing at the College of Business and Behavioral Science at Clemson University. His research on strategic account management, sales technology, customer relationship management (CRM), and marketing strategy includes publications in the Journal of Marketing, International Journal of Research in Marketing, Industrial Marketing Management, Journal of Personal Selling & Sales Management, Marketing Letters, and Journal of Business Research.

Dr. Nikolaos G. Panagopoulos is currently an Assistant Professor of Marketing at the University of Alabama. His research interests include Strategy, Personal Selling & Sales Management, and Firm–Stakeholder Relationships. Nick has contributed many articles in the Journal of Organizational Behavior, International Journal of Research in Marketing, Industrial Marketing Management, Journal of Personal Selling & Sales Management, Journal of Business Ethics, Journal of Business Research, International Journal of Human Resource Management, and European Journal of Marketing.