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Sales and Operations Planning (S&OP): A Group Effectiveness Approach

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ABSTRACT

Sales and Operations planning (S&OP) is an approach meant to help firms achieve demand and supply balance, yet experts agree that it has fallen short on delivering anticipated benefits. Carried out by cross-functional teams, S&OP entails getting people from different thought worlds, especially sales, aligned around common goals. Despite ample practitioner guidance, there is a dearth of scholarly research indicating pathways to success. Using a group effectiveness theoretical framework, this study identifies both internal team factors and contextual influencers that are predictors of S&OP effectiveness. Perspectives were captured from S&OP team members across a wide cross-section of industries representing sales and operations functions using a survey-based approach. Results indicate that internal team factors of social cohesion and decision making autonomy are key drivers of collaboration. Similarly, information quality, procedural quality, and team-based rewards/incentives serve as contextual influencers of collaboration. In turn, collaboration serves as a central mediator, partially linking antecedents to S&OP effectiveness and also serving as a direct influencer of success. Moreover, having joint rewards and incentives, which is often not the case among S&OP teams, is the greatest overall driver of S&OP effectiveness. Overall, these findings provide empirically-based guidance for managers seeking to determine which factors are most important for S&OP team success. Additionally, grounding S&OP in principles of group effectiveness theory will also aid future academic study in efforts to help firms achieve greater demand and supply balance.

INTRODUCTION

Sales and operations planning (S&OP) is a formal process instituted by companies that attempts to balance customer demand with product supply. In a recent survey of global manufacturers, 70% of the study participants had implemented an S&OP process suggesting broad adoption, at least among large-scale firms (Prokopets, 2012). Companies expend significant resources and human capital trying to make S&OP successful. The process is carried out by what can best be described as a cross-functional planning team comprised of mid-level managers and analysts (Stahl, 2010; Wagner, Ullrich & Transchel, 2014). In order to achieve S&OP success the team must reconcile all demand and supply plans at both the detail and aggregate levels and remain synchronized with the overall business plan. Given the complexity and cross-functional nature of the S&OP process, this is a major challenge for most companies.

The challenges posed by S&OP originate at interfaces between marketing and operations subgroups, most frequently, the interface between sales and production. These groups see the world differently and are often at odds largely because they have different goals and they are motivated (e.g. incented) to achieve them in different ways (Mello, 2010; Shapiro, 1977). Sales representatives are typically motivated to grow revenue and be responsive to customers, entailing preferences for wide product variety and selling with a full complement of available products (Oliva & Watson, 2011; Singh, 2010). On the other hand, operations managers are often incented and evaluated according to production efficiency

measures, entailing preferences for narrow product scope and discrete inventory levels (Oliva & Watson, 2011; Shapiro, 1977). From a social perspective, marketing (e.g. sales) managers have typically risen up through the sales ranks while plant managers have ascended through production as foremen and production supervisors. Thus, both groups are pre-disposed to think and speak different languages as they have fundamentally different cultures (Shapiro, 1977). This phenomenon was initially referred to over 60 years ago by Peter Drucker, who called it the "great operational divide" within organizations – the gap between operational and customer facing employee groups that causes goal incongruence and inefficiency as a result (Drucker, 1954).

Cisco provides an example of the sorts of issues that can be created when S&OP failures occur. In the wake of the dot.com downturn during the late 1990s, Cisco Inc. had inventory write-offs of 2.1 billion dollars due to poor balancing of demand and supply (Chase, 2013). This is partially due to costs going up when demand is greater than supply from factors such as overtime, outsourcing, rush orders, and late shipments (Boyer, 2009). Similarly, costs also go up when supply exceeds demand through excess labor, inventory, equipment, and so on (Boyer, 2009). While Cisco and other companies such as Dow chemicals and Dell computers have gone on to develop world-class systems for managing demand and supply, these companies appear as the exception rather than the rule (Chase, 2013). In fact, most companies are not good at matching demand with supply and can benefit from a well-designed and properly implemented S&OP process (Mentzer & Moon, 2004; Wagner et al., 2014).

Given the practical importance of S&OP, academic research has begun the process of identifying what factors are predictive of successful S&OP initiatives (Tavares Thomé et al., 2012). Yet, most articles to date have been authored by consultants and practitioners, appearing in mainstream media operations and supply chain publications. In fact, less than 15% of articles related to supply-chain alignment are published in scholarly journals (Wong et al., 2012). This is especially true in the marketing field, where very few S&OP studies have been undertaken. Given that marketing has been virtually silent on the specific topic of S&OP, it can be reasoned that many marketers view S&OP purely as a supply chain initiative. Considering the important role that marketing and sales have in managing the demand-side of the S&OP equation, this lack of marketing attention represents cause for concern (Jüttner et al., 2007). In more specific terms, engagement of sales in the S&OP process can help in uncovering hidden revenue opportunities during windows of excess supply capacity (Lapide, 2004).

Within the limited academic contributions to S&OP, topics have typically centered on structural components of the operational process (Thomé, Scavarda, Fernandez, & Scavarda, 2012). Several models have emerged in order to aid practitioners in classifying firms according to various levels of S&OP process maturity (Grimson & Pyke, 2007; Lapide, 2004; Muzumdar & Fontanella, 2006; Wagner et al., 2014). Almost completely devoid in the literature are empirical models of the socio-cultural elements needed to predict S&OP success. S&OP has been described as a highly social process (Mello, 2010); it is easy to understand but difficult to implement due to matters that are people-related (Wallace & Stahl, 2008). In fact, navigating S&OP has been described as roughly 60% change management, 30% process, and 10% technology illustrating the importance of social and process-related factors (Chase, 2013; Iyengar & Gupta, 2013).

Practitioner-oriented articles allude to social principles that foster S&OP success such as collaboration (Mello 2015). However, these social factors, while anecdotally observed as important, have received little empirical attention (Oliva & Watson, 2011; Tavares Thomé et al., 2012). A noteworthy exception is a recent qualitative case study involving a single company. In this study, Oliva and Watson (2011) found that the mere formalization of

demand-supply balancing through an S&OP process can enhance constructive engagement between functional groups. The various functional groups were still not trusted to abandon their embedded biases, but constructive engagement improved participant perceptions of informational, procedural, and alignment quality despite an incentive structure that was not altered to complement S&OP team goals. These are interesting findings that warrant further exploration and empirical testing in a wider S&OP context. In fact, a recent summary of S&OP research identified socio-cultural factors surrounding S&OP as an area most in need of further empirical testing beyond case studies (Tuomikangas & Kaipia, 2014).

Therefore, the purpose of this study is to develop and test a theory-driven model of S&OP effectiveness across a wide cross-section of industries. S&OP is analyzed as a cross-functional team from both social and contextual support perspectives. First, a summary of the S&OP process and review of relevant literature is provided. Next, a model of S&OP effectiveness is developed, grounded in principles of group effectiveness theory. Hypotheses derived from the model are tested using a survey-based approach. Then, results and managerial implications are provided, and the study concludes by offering considerations for future research.

S&OP DEFINED AND LITERATURE REVIEW

S&OP has existed in principle going back to the 1980s (Grimson & Pyke, 2007) and emerged out of what was known as materials requirements planning. A formal definition of S&OP from APICS, a leading professional association for supply chain and operations management is as follows:

> A process to develop tactical plans that provide management the ability to strategically direct its businesses to achieve competitive advantage on a continuous basis by integrating customer-focused marketing plans for new and existing products with the management of the supply chain. The process brings together all the plans for the business (sales, marketing, development, manufacturing, sourcing, and financial) into one integrated set of plans. It is performed at least once a month and is reviewed by management at an aggregate (product family) level. The process must reconcile all supply, demand, and new-product plans at both the detail and aggregate levels and tie to the business plan. It is the definitive statement of the company's plans for the near to intermediate term, covering a horizon sufficient to plan for resources and to support the annual business planning process. Executed properly, the sales and operation planning process links the strategic plans for the business with its execution and reviews performance measurements for continuous improvement.
>
> *Source*: APICS Dictionary, 2005, p. 103

The planning horizon for S&OP usually extends between 6 and 18 months into the future with the 12 month mark as the average, coinciding with financial budget cycles (Wallace & Stahl, 2008). The process is generally implemented using some semblance of the steps described next (Grimson & Pyke 2007; Stahl, 2010; Wagner et al., 2014). First, data is gathered typically at the end of the month and key performance indicators are updated based on past performance. Preliminary demand forecasts are developed by sales personnel. These demand forecasts should be unconstrained, meaning that they center on what can be sold to customers irrespective of what can be produced by the company. The consensus unconstrained sales forecast should also incorporate anticipated marketing plans such as new product introductions along with advertising and promotion plans. Lastly, the new forecasts should be converted into monetary terms to facilitate ongoing financial reconciliation. Hence,

the development of the unconstrained demand forecast by sales personnel should involve discussions with both marketing and finance personnel (Wagner et al., 2014).

The next step involves having the operations team concurrently develop an initial supply plan. This plan incorporates supply goals such as inventory build-up or draw-down and is subsequently layered with the unconstrained demand plan in order to create what is often referred to as a rough-cut capacity plan (Grimson & Pyke, 2007). These first two steps might include formal and informal meetings, but the next step involves having a formal S&OP meeting. Stahl (2010) suggests having two formal meetings. The first meeting, often referred to as the pre-meeting, involves mid-level managers and the S&OP process owner or head of the supply chain. The objective is to develop consensus around demand and supply plans and to detail alternate scenarios when consensus cannot be reached. Concurrently, an updated financial plan is generated to compare actual performance against the business plan (Wagner et al., 2014).

The pre-meeting is typically followed by a monthly culmination meeting involving top-level executives and the S&OP process owner (Stahl, 2010; Wagner et al., 2014). Executives reach consensus on decisions that could not be made during the pre-meeting. Key performance indicators are reviewed and business plans/strategies are adjusted accordingly. These process steps are usually repeated each and every month (Wagner et al., 2014).

Tavares Thomé et al. (2012) provide a recent synthesis of both academic and practitioner-based research on S&OP. There are only a handful of quantitative studies using a questionnaire format, most only tangentially related to S&OP, for which brief summaries will now be offered.

Table 1
SUMMARY OF SURVEY-BASED S&OP RESEARCH

Study	Journal	Sample	Method	Propositions	Results
McCormack and Lockamy (2005)	*4th Global Conference on Business & Economics*	*n*=55, Managers from multiple levels representing a variety of U.S. based industries	Single Variable Linear Regression	Formal and informal mechanisms posited to foster functional integration in the supply chain	Both formal and informal exchanges affect performance. Informal collaboration had the largest coefficient at .51
Hadaya and Cassivi (2007)	*Industrial Management & Data Systems*	*n*=53, Supply Chain managers representing U.S. and Canadian based OEMs.	PLS-SEM	Joint collaboration planning will strengthen supply chain relationships, the use of inter-organizational information systems, and firm flexibility	Joint collaboration improved relationships, use of information systems, and firm flexibility
Olhager and Selldin (2007)	*International Journal of Production Research*	*n*=128, Managers from multiple levels representing Swedish manufacturing companies	Regression Analysis	Market uncertainty affects the choice of manufacturing planning and control, which in turn, directly affects performance	Higher levels of planning such as master scheduling and S&OP help firms achieve operational performance, especially under circumstances of high market

					uncertainty
Nakano (2009)	*International Journal of Physical Distribution & Logistics Management*	*n*=65, Managers representing Japanese manufacturing companies	Regression Analysis	High degrees of internal collaborative forecast planning will impact planning with suppliers, retailers, and positively impact performance	S&OP enhanced collaboration with suppliers and customers and helped to improve performance measures related to logistics and production
Wagner, Ullrich, and Transchel (2014)	*Business Horizons*	*n*=88, Managers representing process-based manufacturing companies from a variety of European countries	Mixed-Methods including simple reporting of means	S&OP will help to align strategic and tactical plans across a variety of indicators	Most firms describe their S&OP process maturity at the low-level reactive stage
Thomé, Sousa, Scavarda and Carmo (2014)	*International Journal of Production Research*	*n* =725, Directors of Operations representing manufacturing companies across several countries	Multiple stepwise regression	Assess the impact of internal S&OP practices and integration of the supply chain on manufacturing performance	Internal S&OP practices had a moderately to large positive effect on key aspects of manufacturing performance
Thomé, Sousa, and Carmo (2014)	*Industrial Management & Data Systems*	*n* =725, Directors of Operations representing manufacturing companies across several countries	Hierarchical regression analysis	Assess the moderating role of process and product complexity on the link between internal S&OP practices and manufacturing performance.	Extends the previous study by showing that product and process complexity amplifies the link between S&OP practices and dimensions of manufacturing performance

A common theme among these empirical studies is a focus on external relationships with suppliers and customers. They also tend to focus on integration more widely at the expense of a direct focus on the cross-functional S&OP team and related socio-cultural elements that drive S&OP team effectiveness. Excluding the most recent studies, another common theme is small sample sizes. Moreover, there is limited effort to ground S&OP research in theory including multi-stage models of associated relationships. Nevertheless, the wave of recent empirical articles indicates that scholars are starting to answer the call for more rigorous quantitative study of S&OP and the key success factors related to S&OP success.

THEORETICAL BACKGROUND AND HYPOTHESES

Group Effectiveness

Principles of group effectiveness are often organized by input-process-output (IPO) models that are applicable to a wide variety of work teams (Hackman, 1987; Nakata & Im,

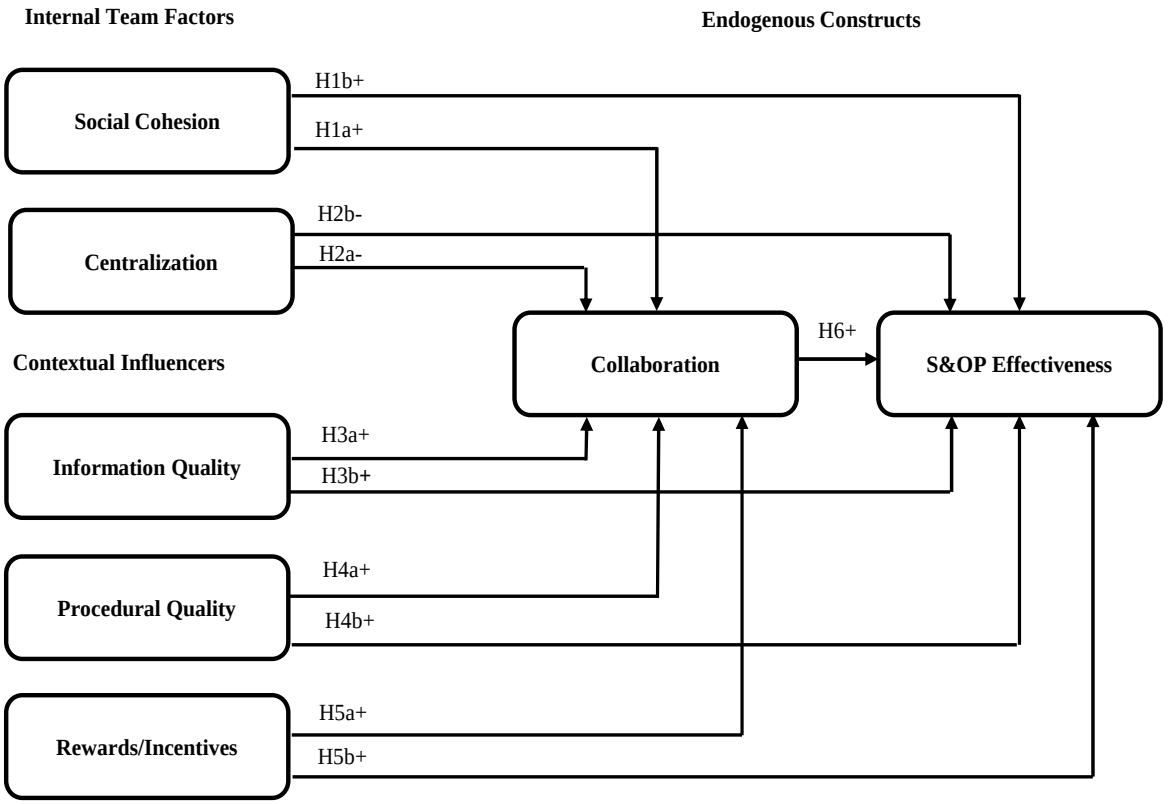
2010; Vincent, 2010). The success of various work teams hinges on both internal group dynamics and contextual factors that are external to the team but still within the firm (Hackman, 1987; 1990). Intra-team facets can be categorized as dynamics such as group autonomy and cohesiveness (Nakata & Im, 2010). Extra-team facets are labeled as contextual influencers and encompass a wide-variety of factors in the group's immediate work environment including such aspects as reward systems and available resources (Nakata & Im, 2010).

A core premise of IPO research is that inputs will affect group interactions which in turn lead to group consequences (Hackman, 1990; McGrath, 1964; Nakata & Im, 2010). For example, in certain settings groups with high-levels of cohesiveness (input) will affect change in group interactions (process) that subsequently improve group performance (output). The interactions of highly cohesive teams could involve greater encouragement within the team, more time spent collaborating, and more effort spent on team-related tasks (Hackman, 1987). However, the linear nature of IPO models does not preclude the possibility that inputs can have direct effects on outputs that do not necessarily flow through intervening process variables (Driedonks, Gevers, & Weele, 2014). Indeed, group effectiveness as advanced by certain scholars (e.g. Hackman 1987; Cohen & Bailey, 1997) shifted the focus from interventions associated with group interactions as popularized in psychology to focus more on group inputs. Hence, the way that groups are set up and initially managed can greatly influence success.

A group effectiveness approach is especially applicable for the investigation of small and complex work groups, and it has been extended to analyze the success of cross-functional new product development teams (Nakata & Im, 2010) and cross-functional global sourcing teams (Driedonks et al., 2014). S&OP is performed by what can best be described as a cross-functional team organized to tackle vexing demand-supply challenges within firms (Stahl, 2010; Wagner et al., 2014). As such, a cross-functional team is defined as: "a group of people who apply different skills, with a high degree of interdependence, to ensure the effective delivery of a common organizational objective" (Holland, Gaston & Gomes 2000, p. 233). Considering the wide-scope of IPO frameworks, coupled with the nascent stage of S&OP research, group effectiveness principles are especially suitable for exploring the cross-functional, team-based factors that apply to S&OP planning.

Offered specifically, are two team-level dynamics and three contextual factors to serve as model inputs. Collaboration serves as the central process variable and S&OP effectiveness as the output. The constructs were selected from the wide body of descriptive S&OP practitioner literature, more narrow body of academic inquiry into S&OP, similar contexts involving cross-functional product development and sourcing teams, and lastly, the voluminous organizational behavior literature on group effectiveness. These inputs do not represent the only potential antecedents of collaboration; however, they are in keeping with the dual focus of group effectiveness research on both internal team factors and external team influencers (Nakata & Im, 2010). Moreover, the inputs chosen are considered to be highly salient variables based on a review of the literature and they serve as a manageable number of factors to test.

Figure 1
S&OP EFFECTIVENESS MODEL



Collaboration

At its core, S&OP planning seeks to formalize collaboration between the functions that manage demand and supply (Wallace & Stahl, 2008). This formal collaboration is manifested in one or more S&OP meetings per planning period designed to develop overall integration and plan consensus (Stahl, 2010). Yet, even though cross-functional S&OP meetings may occur, their effectiveness can be greatly reduced without genuine collaboration (McCormack & Lockamy, 2005). There are preliminary indications that S&OP, when done well, can foster higher levels of informal collaboration (Oliva & Watson, 2011; Thomé et al., 2012). In turn, genuine collaboration allows different areas to "converse, learn and work across the silos that have characterized organizational structures" (Liedtka, 1996, p. 25).

Collaboration in this study is defined as the degree to which S&OP teams achieve goals collectively through joint planning efforts and informal communication, including a willingness to develop mutual understanding. It is described in the S&OP practitioner literature as the key element that allows groups to bridge their functional silos, solve vexing problems, and build trust (Sinha, 2015). However, considering that S&OP is practiced in a series of sequential steps with some experts suggesting only one formal meeting of the entire S&OP team per planning period; (e.g. Grimson & Pyke, 2007) the degree to which collaboration fosters S&OP success warrants empirical attention. Therefore, collaboration is projected as the central (process) variable in this study, anticipated to partially link antecedents to S&OP effectiveness.

S&OP Effectiveness

Concerning the measurement of group effectiveness, Hackman (1990) argues that desirable outcomes (e.g. group success) can be assessed according to three dimensions. The first dimension is that effective teams meet their client's expectations. A second measure of success is when a group is more capable of working interdependently when the work is finished than when the work began; hence, teams become effective collectively and will be poised to work together again in the future. Lastly, the group work should influence individual team members in a positive way such that individuals feel that they have learned and grown as result of the process (Hackman, 1990). Conversely, if people's "main reactions to the group experience are frustration and disillusionment, then the costs of generating the group product were too high" (Hackman et al., 2000, p.112).

A more recent synthesis of the literature notes that various effectiveness measures have greatly expanded since the seminal review of team research done by Cohen and Bailey in 1997. Effectiveness measures have grown to include such things as organizational performance, creativity, problem management, productivity, and many others (Mathieu et al., 2008). S&OP effectiveness in this study is defined as the extent to which S&OP team members view the experience positively, coupled with a sense that the team is successful in terms of overall S&OP performance. Therefore, this conceptualization of S&OP effectiveness combines traditional evaluations of group effectiveness with a context specific assessment of performance.

Internal Team Factors

Social Cohesion

The first internal team factor, social cohesion, is defined as the extent to which S&OP team members enjoy working with each other and are able to maintain collegiality within the group (Nakata & Im, 2010). As a core principle of social identity research, cohesion serves to help groups overcome negative stereotypes originating from members representing different functional areas (Sethi, Smith & Park, 2001). While it has not been studied in an S&OP context specifically, social cohesion is a common antecedent in models of group effectiveness (Cohen & Bailey, 1997; Nakata & Im, 2010). Interpersonal social ties have a positive effect on exchanges within a team, and thus, help to facilitate integration (Mullen & Copper, 1994; Vincent, 2010).

Social cohesion has been identified as an important determinant of stronger communication between different functional units within new product development teams (Moenaert et al., 1994). Similarly, it has also been directly linked to cross functional integration of product development teams (Nakata & Im, 2010). Positive emotions are helpful in overcoming negative attitudes and ingrained stereotypes that keep functional areas siloed (Dougherty, 1992).

Given the cross-functional nature of S&OP teams and the inherent difficulties in bridging these disparate thought worlds, social cohesion is an especially salient variable for this study. Being able to see the value in other's perspectives is a likely prerequisite to achieving genuine collaboration. Furthermore, having team members that are committed to maintaining interpersonal relationships should help to mitigate excessive levels of negativity and disillusionment. Assuring that frustration levels do not become too high is one of Hackman's (1990) criteria for assessing group effectiveness. Hence, it is hypothesized that:

H1a *There is a positive association between social cohesion among S&OP team members and collaboration within the S&OP team.*

H1b *There is a positive association between social cohesion among S&OP team members and S&OP effectiveness.*

Centralization

The second internal team factor likely to impact collaboration is centralization. Defined as the extent to which the concentration of S&OP decision making resides with upper management, centralization is an alternate way to measure levels of team autonomy (Hage & Aiken, 1967; Menon, Jaworski & Kholi 1997). High levels of centralization (e.g. low levels of autonomy) have been associated with decreased levels of job satisfaction and greater feelings of isolation among individual workers (Hage & Aiken, 1967; Pfeffer, 1981). In a cross-functional team setting, high levels of centralization inhibited constructive exchange of ideas (Menon et al., 1997) and heightened dysfunctional conflict as information became a weapon in turf battles between functional areas (McClure, 2010). Moreover, excessive meddling by top managers has been found to suppress group motivation (Trent & Monczka, 1994), and it detracts from interdepartmental connectedness, leaving workers disillusioned and advocating for functional views instead of acting as team players (Holland et al., 2000).

Tavares Thomé et al. (2012) echo the importance of team empowerment (e.g. decentralization) in their synthesis of S&OP research. When event driven meetings begin to occur above and beyond regularly scheduled meetings, this situation serves as a proxy that teams have become empowered and are at advanced stages of S&OP maturity (Grimson & Pyke, 2007). Concurrently, the practitioner literature anecdotally suggests decentralization of decision making as a key success factor for S&OP (Lapide, 2004). However, the degree of empowerment needed in an S&OP setting remains unclear and needs empirical testing. In fact, team-level autonomy as an input of generalized IPO models of group effectiveness has shown mixed results across various contexts. In their seminal review of work teams, Cohen and Bailey (1997) acknowledge that desire for group autonomy, and the associated performance implications, vary depending on the type of team being studied.

Decision latitude appears to be important for permanent teams, while simultaneously not as important when group tasks are routine and well understood (Stewart, 2006). S&OP is inherently designed to centrally connect strategic planning with more detailed operational planning, involving at least some degree of creative decision making (Wallace & Stahl, 2008). Furthermore, S&OP teams are not designed to be temporary in nature. Thus, it is likely that autonomy does matter in an S&OP setting and it is hypothesized that:

H2a *There is a negative association between centralization and collaboration within the S&OP team.*

H2b *There is a negative association between centralization and S&OP effectiveness.*

Contextual Influencers

Information Quality

Unlike internal team factors, contextual influencers such as information sharing and quality have received considerable attention in an S&OP context from researchers and practitioners alike (Bower & Fossella, 2013; McCormack & Lockamy 2005; Oliva & Watson, 2011). Information quality is defined as the extent to which information shared

between S&OP team members is appropriate, both in content and in form, for decision making. (Oliva & Watson, 2011). It is a contextual influencer because the information ultimately shared among team members may originate from several different places both within and outside of the firm.

From a theoretical perspective, transfer of information to the team is considered a necessary precursor for group effectiveness (Denison, Hart & Kahn, 1996; Hackman 1987; 1990). Standard S&OP practice suggests that information is shared both synchronously and asynchronously throughout the process (Grimson & Pyke, 2007; Stahl, 2010). However, exchange is of little value if the information is of low quality (Oliva & Watson, 2011). For instance, consultants and practitioners decry poor accuracy of sales forecasts as one of the main sources of S&OP dysfunction (Stahl & Wallace, 2012).

In their qualitative case study, Oliva and Watson (2011) witnessed a robust business assumptions package, developed over time that incorporated information about price changes, product offerings, promotion schedules, competitor actions, and general market conditions. Norms developed within the S&OP team that encouraged more information sharing in the plan and discouraged each function from with-holding knowledge; hence, information quality fostered collaboration. Therefore, to empirically test and replicate this single company observation, this study hypothesizes:

H3a *There is a positive association between S&OP related information quality and collaboration within the S&OP team.*

H3b *There is a positive association between S&OP related information quality and S&OP effectiveness.*

Procedural Quality

The group effectiveness literature espouses the important role of structured approaches to team work (Ford & Randolph 1992; Hackman, 1987). For instance, having formalized procedures in place within product development teams increases the likelihood of achieving new product success (Montoya-Weiss & Calantone, 1994). Similarly, Nakata and Im (2010) identify the degree of planning process formalization as a contextual support factor in their rendition of a group effectiveness model predicting new product performance. Support was found for higher levels of cross-functional integration predicated on higher levels of planning process formalization (Nakata & Im, 2010). Furthermore, in a cross-functional sourcing team context, formalization was found to be the best predictor directly leading to team effectiveness (Driedonks et al., 2014). Specifically within a marketing context, having a more defined process is suggested as a synergistic lever that can aid the often dysfunctional interface between sales and marketing (Hughes, Le Bon & Malshe, 2012).

Procedural factors have been the focus of most of the attention in the S&OP literature. Several researchers have sought to describe various stages of S&OP process maturity assessed along procedural dimensions (Grimson & Pyke 2007; Wagner et al., 2014). Moreover, consultants have written manuals and handbooks offering practitioners advice in step-by-step fashion for how to administer S&OP (Wallace & Stahl, 2008). The recurring nature of S&OP suggests a need for high quality procedures to ensure planning integrity. Despite the attention given to process by S&OP scholars, there is scant empirical evidence validating its importance in this context. In a rigorous case study, Oliva and Watson (2011) identified procedural quality as an important determinant of S&OP satisfaction. Defined as the extent to which the S&OP process continuously ensures that the rules of inference used

by the team are sound (Oliva & Watson, 2011); the authors argue that the strong degree of procedural quality they witnessed was a key contributor to achieving constructive engagement. This single company finding is important to validate more widely given the critical role assumed for process-related factors in an S&OP setting. Thus, it is hypothesized that:

H4a *There is a positive association between procedural quality of the S&OP process and collaboration within the S&OP team.*

H4b *There is a positive association between procedural quality of the S&OP process and S&OP effectiveness.*

Rewards and Incentives

A core principle of group effectiveness theory is to align rewards and incentives with team-related goals based on the premise that people tend to pursue behaviors that are rewarded and this is no different for groups (Hackman et al., 2000). Joint rewards enhance perceptions of interdependence and facilitate responsiveness (Chimhanzi, 2004). Hence, team effectiveness should be measured. Scholars acknowledge a growing trend to reward employees based on joint goals in addition to individual goals (Arndt, Karande & Landry, 2011). When rewards are allocated strictly through functional areas, at the very least, group effectiveness theory indicates that firms should be careful that these rewards do not unknowingly promote disincentives for teamwork (Hackman et al., 2000). Holland et al. (2000) largely credit the disbanding of quality circles because of a lack of associated team evaluation and reward systems.

Yet, the allocation of rewards for teamwork is a complex undertaking and has exhibited mixed results. Having joint evaluation and reward procedures preceded inter-functional cooperation between marketing, research/design, and manufacturing in a new product development context (Song, Montoya-Weiss & Schmidt, 1997). In a marketing and human resources integration study, joint reward systems positively impacted communication but not connectedness between the two functions (Chimhanzi, 2004). Meanwhile, Rouziès et al. (2005) suggest that the use of incentives requiring achievement of integrated goals positively impacts sales and marketing integration. Additionally, Xie, Strong, and Stringfellow (2003) found that the greater use of joint rewards leads to less goal incongruity in new product develop teams across multiple countries.

Conversely, Trent and Monczka (1994) did not find a significant relationship between joint evaluation/rewards and cross-functional participation in sourcing teams. The authors pointed out that only a small fraction of the teams in their study were evaluated and rewarded based on their participation in sourcing teams, and Trent (1998) has continued to advocate for rewarding team-based efforts as a best practice of sourcing strategy. In a more recent sourcing study, team-based rewards exhibited positive association with group effort, but an anticipated positive effect on overall effectiveness was not supported (Driedonks et al., 2014). Once again, the authors noted that many responders were not rewarded specifically for their sourcing team involvement, but no other explanation was given for the overall lack of hypothesized support.

Similarly, in an S&OP context, having a lack of team-based rewards and incentives may be especially concerning considering that team members may only devote a fraction of their time to the initiative. If there are no rewards and incentives directly tied to the process, group effectiveness theory indicates that it may be difficult for S&OP to achieve the priority level needed among team members. Yet, motivating the industrial sales force to focus on part-time initiatives beyond direct growth of revenues has proven to be a complex

undertaking. Researchers found that compensation tied to demand forecasting efforts did not serve as a significant motivator for the sales force to effectively engage in the process (Byrne, Moon & Mentzer, 2011). Further still, in a single case study of S&OP, Oliva and Watson (2011) found a robust S&OP process in absence of having team-based rewards and incentives. They speculated that the absence of joint rewards spurred the functions to constructively engage as a means of ensuring that their function's interests were protected. On the other hand, Wagner et al. (2014) cite the presence of bonuses tied to achieving S&OP key performance indicators as a signal of S&OP process maturity. Consultants also advocate for incenting S&OP team members to achieve team-based goals (Singh, 2010). For example, sales should be incented to care not only about new signings and revenues, but the associated costs (e.g. inventory management) as well. Therefore, this study hypothesizes that:

H5a *There is a positive association between S&OP team-based rewards/incentives and collaboration within the S&OP team.*

H5b *There is a positive association between S&OP team-based rewards/incentives and S&OP effectiveness.*

Outcome

There is a dearth of empirical research assessing S&OP effectiveness, and corresponding frameworks indicating pathways to this effectiveness (Thomé et al., 2012). Usually companies that are reaping the benefits of S&OP are described as having achieved higher stages of S&OP process maturity (Grimson & Pyke 2007; Wagner et al., 2014). These models note that in early stages, operations will often simply acquiesce to sales forecasts. Sales and marketing managers may disengage from meetings as they see little purpose for their involvement (Lapide, 2004; Singh, 2010). In fact, it has been suggested that the sales function is often resistant to the fundamental premise of S&OP when the process owner is from operations (Alexander, 2013). This is a mistake as engagement on both sides is likely to uncover hidden revenue opportunities for sales (Lapide, 2004). These discoveries are most likely to occur through the course of informal collaboration and during S&OP planning meetings. In a similar context, higher levels of collaboration between sales and marketing, two groups that also traditionally have strained cross-functional relations, was associated with increased business performance (Le Meunier-FitzHugh & Piercy, 2007)

There is also tentative case study support specifically in an S&OP context that actively engaged team members perceive positive benefits, especially in the area of horizontal alignment (Oliva & Watson, 2011). S&OP goals are more likely achieved when collaboration is robust. Hence, in keeping with the voluminous body of S&OP practitioner literature that stresses the crucial role of collaboration, it is important to subject this direct linkage between collaboration and S&OP effectiveness to scholarly scrutiny. Also, in keeping with the accepted logic of IPO models, it is projected that S&OP effectiveness (output) stems from collaboration (process), which in turn, is predicated on internal team and contextual influences (inputs). Thus, it is hypothesized that:

H6 *There is a positive association between collaboration within the S&OP team and S&OP effectiveness.*

Mediation

In his review of previous group effectiveness research, Stock (2004) notes that most studies fail to include two-stage models incorporating a process (i.e. group interaction) variable in the middle such as coordination or collaboration. He posited that the mixed

findings likely stemmed from a failure to capture the process variables that likely facilitated the relationships between inputs and outputs. Conversely, IPO models are often invoked with implicit assumptions of mediation that are not formally tested (Ilgen et al., 2005). It is common in group work for predictors to exhibit direct, indirect, or both types of relationships with dependent measures (e.g. Driedonks et al., 2014; Pinto, Pinto & Prescott 1993; Smith et al., 1994). By analyzing direct and indirect relationships simultaneously with structural equation modeling, we can better understand the nuanced associations that exist within IPO models (Stock 2004).

Collaboration is proposed as the central process variable in this study projected to partially link inputs to outputs. While there is plenty of anecdotal evidence in the guidebooks to suggest that collaboration is central to the S&OP process, unraveling the degree to which collaboration matters has relevance for both group effectiveness research and S&OP practice. Direct relationships have already been proposed between inputs and S&OP effectiveness. Thus, it also important to explore the facilitating role that collaboration has in linking the inputs to S&OP effectiveness. Taken collectively, it is hypothesized that:

H7 *Collaboration within the S&OP team will partially mediate the associations between inputs and S&OP effectiveness.*

METHODOLOGY

Data Collection

A cross-sectional survey was employed to measure the constructs in the S&OP effectiveness model. The questionnaire was designed to assess key informant perceptions of the S&OP processes at their respective companies. Key informants are core S&OP team members representing mid-level management from the functional areas of sales and operations. The goal was to cover a wide cross-section of companies and industries with a relatively balanced mix of sales and operations perspectives. Key informant designs are prevalent in measuring the team-based constructs proposed in this study (*see* Akgün et al., 2012; Carbonell & Rodriguez, 2006; Sethi et al., 2001). The questionnaire was initially reviewed by academic experts (n = 5) with knowledge of S&OP and survey design expertise. The survey was refined and then pretested with core S&OP team members from both sales and operations (n = 11) in an online panel hosted by Qualtrics. Based on feedback obtained, the survey instrument was further refined for actual study implementation.

Analytic Approach

SPSS 23 was used to conduct an exploratory factor analysis, report descriptive statistics, and report between-construct correlations. Partial least squares structural equation modeling (PLS-SEM) was used to assess the structural model and to test the hypothesized linkages. PLS-SEM can be an acceptable alternative to covariance-based structural equation modeling (CB-SEM) when the research is exploratory in nature, the model is complex, and the sample size is small – all characteristics of the current research (Hair, Ringle & Sarstedt, 2011). Also, PLS-SEM is well suited for maximizing predictive capabilities and identifying key drivers of target constructs (Hair et al., 2013). Considering the need to identify key drivers of S&OP success, the choice of PLS-SEM is both appropriate and consistent with the overwhelming practitioner focus that has been the foundation of S&OP scholarship. There is also precedence for using PLS-SEM specifically in an S&OP context (*see* Hadaya & Cassivi, 2007). Hair and colleagues (2011) indicate that the sample size for PLS-SEM should exceed ten times the maximum number of paths pointing at an endogenous construct within

reflective models. The maximum number of arrows is 6 directed at S&OP effectiveness suggesting a minimum sample size of 60. SMART-PLS software version 3.1.5 was used for modeling and reporting purposes (Ringle, Wende & Becker, 2014).

To collect the final study data, a Qualtrics online panel was used. The sample frame consisted of S&OP team members from medium to large-size B2B companies. The firms represented a wide cross-section of companies spanning over 50 different industries. Traditional industrial manufacturing was prominent, but the sample also contained such industries as financial services, aerospace/defense, and consumer goods. Companies with a minimum of 100 million dollars in annual revenues were targeted because smaller firms are not likely to have a formal S&OP process involving multiple team members (Wallace & Stahl, 2008). The companies ranged in size from $125 million to $80 billion in annual revenues with a median size of $3 billion. Mid-level managers were the primary target group representing the functional areas of sales and operations. In order to qualify for survey completion, respondents had to indicate that they were core S&OP team members, meaning that they were involved in analyzing information and attending S&OP meetings involving other functional units.

Of 933 surveys initiated, 144 respondents met the qualifying criteria for an internal response rate of 15.4%. Of the 144 qualified responders, 20 were eliminated based on failure to complete the entire survey. One additional response was eliminated based on answers given to several of the control questions that were deemed as infeasible. The final total consisted of 123 complete and valid responses; therefore, based on a recommended PLS-SEM minimum sample size of 60, the actual sample size is more than adequate for testing purposes. The sample comprised 101 mid-level managers, 14 top-level managers, and 8 analyst-level respondents. Seventy respondents are from sales and 53 are from operations; hence, achieving a balance of perspectives from both sides of the S&OP divide. There were 100 males and 23 females, and the average age is 47 with 25 years, on average, of work experience. No significant differences were found between early and late respondents concerning response patterns.

Since the objective was to test the group effectiveness model from the perspective of mid-level managers, a multi-group analysis was conducted using the heuristic offered by Henseler, Ringle & Sinkovics (2009) for detecting differences between heterogeneous groups within PLS-SEM. The test was performed to assess if the small number of combined top-level and analyst-level respondents differed significantly from the target group of mid-level managers on the associations proposed in the structural model. There were no significant path coefficient differences between the two groups on any of the direct and indirect associations in the model; thus, all 123 responses were kept in the dataset for final analysis.

Measures

Items in the questionnaire were based on established scales when appropriate and available. All items were rated on either five or seven-point Likert-type scales. (e.g. 1 = “Strongly Disagree” and 7 = “Strongly Agree”). Minor wording changes were made to the established scales in many cases to adjust for an S&OP setting. The social cohesion scale from Nakata and Im (2010) was adapted containing 4 items. Procedural quality was adapted from the planning process formalization scale of Nakata and Im (2010) containing 4 items. The 5-item centralization scale from Menon et al. (1997) was also used with minor adaptation to reflect an S&OP setting. Meanwhile, the rewards/incentives scale contains 8 items based loosely on the joint-reward scales used in Xie et al. (2003) and Song et al. (1997). The information quality scale was adopted from Li and Lin (2006) containing 5 items. The collaboration scale

consists of 4 items gleaned from Kahn and Mentzer (1998) and collaboration descriptors from Min et al. (2005). Lastly, this study used a newly created 4-item S&OP effectiveness scale based on Hackman's (1990) criteria for group effectiveness. Given the exploratory state of survey research in this area, it is common for new measures to be employed in S&OP studies (McCormack & Lockamy, 2005; Wagner et al., 2014). For control purposes, environmental turbulence has been suggested to have an impact on S&OP (Tavares Thomé et al., 2012). In this study, environmental turbulence is captured in the more specific measures of market and technological turbulence (Menon et al., 1997). Additional variables controlled for include firm size (i.e. number of employees), industry classification, and length of time on the S&OP team.

Measurement Model

Considering the early state of S&OP survey research, an exploratory factor analysis (EFA) was conducted on the measurement model. More specifically, a principal components EFA was conducted using promax rotation and extracting eigenvalues > 1. With the removal of 3 items that had poor factor loadings or high cross-loadings, the EFA yielded 7 factors matching a priori expectations regarding the constructs in the model and confirming the unidimensionality of each construct (*see* figure 1). Additionally, both the Kaiser–Meyer–Olkin (KMO) value of .873 and Bartlett's Test of Sphericity ($\chi 2$ 2819 df = 561; p = .000), exceeded acceptable thresholds (Hair et al., 2010), indicating that the factor structure is appropriate.

In sum, 31 of the 34 items were retained for further analysis and each construct has at least four indicators. All items had loadings and communalities above .50. No cross-loadings exceeded .28 and there was a difference of greater than .30 in all cases involving cross-loadings and main factor loadings.

Further analysis of the measurement model was conducted in PLS-SEM. While the program contains no global goodness-of-fit criterion, it does provide a standardized root mean square residual value (SRMR). This computation assesses discrepancies in fit between observed and expected correlation matrices, thus, serving as an absolute measure of model fit criterion (Henseler et al., 2014a). Conservative standards suggest that models should have SRMR values less than .080 (Hu & Bentler, 1999). The S&OP effectiveness model achieved an SRMR value of .075 indicating a good fit. Next, model fit was assessed at both the construct and individual item levels. All indicators had acceptable loadings above .70 (Bagozzi, 1980). Each construct exhibited convergent validity with average variance extracted (AVE) greater than .50 (Fornell & Larcker, 1981) and reliability estimates greater than .70 using Cronbach's alpha scores (Hu & Bentler, 1999).

Discriminant validity was checked in three ways: First, all items loaded highest on their respective constructs; this criterion is often referred to as the cross-loadings test (Chin, 1998). Second, the square root of each latent variable AVE exceeds the highest correlation with other constructs (Fornell & Larcker, 1981). Lastly, within PLS-SEM it is recommended to check for discriminant validity using the heterotrait-monotrait (HTMT) method as this test can uncover cases in which discriminant validity is lacking even while meeting the Fornell-Larcker criterion (Henseler, Ringle & Sarstedt, 2014b). The S&OP effectiveness model passed the HTMT test using the most conservative threshold. For more details concerning the measurement model, table 2 lists all of the scale items including anchor labels and scale points, along with denoting which items were removed. Moreover, table 3 contains AVEs, correlations, means, ranges, standard deviations, and reliabilities for each construct.

Table 2 **SURVEY ITEMS**	**LOADING**
CENTRALIZATION	
Thinking about the S&OP process at your company, to what extent do you agree or disagree with the following statements: (1 = Strongly Disagree; 7=Strongly Agree)	
There can be little action taken by the S&OP team until upper management approves	.77
Decisions made purely by the S&OP team would be quickly discouraged by upper management	.79
Even small matters have to be referred to upper management for a final answer	.89
We have to ask upper management before we do almost anything	.89
Any decision that we make as an S&OP team has to have approval from upper management	.84
COLLABORATION	
During the past six months, to what degree did the S&OP team pursue the following activities and experience the following conditions: (1=Never; 7=Very Frequently)	
Engage in joint planning	.80
Have a mutual understanding	.87
Informally work together	.84
Achieve goals collectively	.88
INFORMATION QUALITY	
Thinking about the S&OP process at your company, to what extent do you agree or disagree with the following statements: (1=Strongly Disagree; 5=Strongly Agree)	
Information exchange within our S&OP team is timely	.80
Information exchange within our S&OP team is accurate	.86
Information exchange within our S&OP team is complete	.85
Information exchange within our S&OP team is adequate	.80
Information exchange within our S&OP team is reliable	.85
PROCEDURAL QUALITY	
Thinking about the S&OP process at your company, to what extent do you agree or disagree with the following statements: (1=Strongly Disagree; 7=Strongly Agree)	
In our S&OP process, plans have a specific format that is used by everyone	.84
We have clearly defined procedures for completed each step in the process	.86
We know which information sources are to be used in developing S&OP plans	.85
We have a precise timetable for completing the S&OP process	.79
REWARDS/INCENTIVES	
Thinking about the S&OP process at your company, to what extent do the following things occur: (1=Never; 5=Always; *=Item deleted)	
Our senior management promotes team loyalty over functional loyalty*	
Team members are evaluated based on team performance instead of individual performance*	
Departments share equally in the rewards from achieving S&OP goals*	
There are team based rewards for achieving customer service targets	.85
There are team based rewards for achieving inventory management targets	.78
Formal evaluation criteria are used for S&OP teamwork	.78
The team receives recognition when S&OP goals are exceeded	.86
The team receives financial incentives for exceeding S&OP goals	.81
S&OP EFFECTIVENESS	
Thinking about the S&OP process at your company, to what extent do you agree that the process has accomplished the following: (1=Strongly Disagree; 7=Strongly Agree)	
Increased the level of understanding regarding challenges faced by each function	.76
Enhanced team members' sense of professional accomplishment	.82
Increased willingness of S&OP team members to keep working together in the future	.86
Created a sense that the team is successful in terms of overall S&OP performance	.89
SOCIAL COHESION	
Thinking about the S&OP team, to what extent do you agree or disagree with the following statements: (1=Strongly Disagree; 7=Strongly Agree)	
Members of the S&OP team are very comfortable with each other	.87
Members of the S&OP team are very friendly with each other	.88
Our S&OP team has a very pleasant working atmosphere	.93
Members of the S&OP team are committed to maintaining close interpersonal relationships	.81

Table 3: AVEs, Correlations, Means, Ranges, Standard deviations, Reliabilities.

Constructs	X1	X2	X3	X4	X5	X6	X7	X8	Mean	Range	S.D.
Centralization (X1)	0.89								3.76	5.80	1.35
Collaboration (X2)	-0.31	0.87							5.20	5.00	1.06
Fanmanship (X3)	-0.09	0.12	0.88						4.94	6.00	1.69
Information Quality (X4)	-0.36	0.54	0.13	0.89					3.50	4.00	0.77
Procedural Quality (X5)	-0.16	0.52	0.04	0.48	0.86				5.00	4.75	1.13
Rewards/Incentives (X6)	0.10	0.41	-0.06	0.28	0.27	0.87			3.20	4.00	0.96
S&OP Effectiveness (X7)	-0.29	0.63	0.16	0.56	0.54	0.38	0.85		4.87	4.75	0.92
Social Cohesion (X8)	-0.40	0.57	0.20	0.53	0.55	0.18	0.54	0.89	4.86	4.50	1.10
AVE	0.70	0.72	0.80	0.69	0.70	0.66	0.70	0.76			

Bolded values on the diagonal are Cronbach's alphas.

Common Method Bias

All of the constructs are self-reported including predictor and criterion variables presenting potential for common method bias (Podsakoff et al., 2003). In keeping with best practices, potential issues with common method bias were mitigated at the outset by varying the number of scale points and scale anchor labels in the survey (Podsakoff et al., 2003). Additionally, a marker construct, not theoretically related to other study variables, was strategically placed within the questionnaire a priori allowing for post-hoc testing of potential common method bias effects. The marker construct, fanmanship, is a 3-item scale designed to assess the degree to which someone is an avid sports follower, and it was originally used as a predictor of gambling propensity (Mowen, Fang & Scott, 2009).

An examination of the correlations in table 3 demonstrates that consistent with a priori theoretical expectations, the marker variable has the lowest association with other constructs. More importantly, the marker variable does not have a significant or meaningful association with the criterion variables; hence, an initial review is favorable against undue influence of common method bias. Next, using the lowest correlation between constructs, a discounted correlation matrix was created per the marker variable heuristic offered by Lindell and Whitney (2001). There were no sign changes or loss of significance between the predictor and criterion variables in the discounted correlation matrix indicating that common method bias is not of major concern for results interpretations.

Finally, variance inflation factor (VIF) scores were computed for the constructs in order to detect potential issues associated with multicollinearity. Hair et al. (2013) suggest that VIF scores exceeding 5.0 can be problematic when attempting to interpret individual path coefficients. All construct VIF scores were below 2.5. Meanwhile, none of the individual items on any of the scales exceeded VIF scores of 4.0, indicating that multicollinearity does not pose undue influence on results interpretations.

RESULTS

A results summary for all of the hypothesized associations is offered in table 4. First, among the internal team factors social cohesion exhibited a positive and significant influence on collaboration (β=.25; p<.01) but not on S&OP effectiveness (.05<p<.10). Hence, H1a is supported while H1b is not. Meanwhile, centralization is negatively associated with collaboration (β=-.15; p<.05), but not with S&OP effectiveness (p>.10).

Next, among the contextual influencers, information quality exhibited a positive and significant impact on both collaboration (β=.17; p<.05) and S&OP effectiveness (β=.18; p<.05). Procedural quality also positively impacts both collaboration (β=.21; p<.01) and

S&OP effectiveness (β=.19; p<.05). Therefore, H3a, H3b, H4a, and H4b are all supported. Additionally, rewards/incentives is significantly linked to collaboration (β=.29; p<.01) and influences S&OP effectiveness (β=.14; p<.05) lending support for H5a and H5b. Analyzing the second part of the two-stage model shows that collaboration significantly and positively impacts S&OP effectiveness (β=.28; p<.01), supporting H6. Overall, nine of the eleven direct-effect linkages are supported.

Lastly, collaboration was tested for potential mediation with each of the inputs using the Preacher and Hayes (2004) bootstrapping method as recommended and outlined by Hair et al. (2013) for PLS-SEM. Once mediation was confirmed, scores were calculated to determine the degree of variance accounted for, or said another way, how much of the associations are absorbed by the mediator. Hair et al. (2013) suggest that variance accounted for values below 20% indicate no true mediation, scores between 20% and 80% indicate partial mediation, and scores above 80% indicate full mediation. Results indicate that collaboration partially mediates the associations between all of the antecedents and S&OP effectiveness, albeit at modest levels. The variance accounted for each input are as follows: social cohesion (34%), centralization (30%), information quality (21%), procedural quality (24%), and rewards/incentives (36%); hence, H7 is supported. The framework exhibited robust effects overall as captured in the adjusted R-squared values for the two endogenous constructs: collaboration (.50) and S&OP effectiveness (.52).

Table 4: Results of Hypotheses

		A. Collaboration				B. Effectiveness			
Hypotheses	Predictors	β	t	p	Result	β	t	p	Result
H1	Social Cohesion	.251	2.72	.003 ***	Supported	.129	1.32	.093 *	Not Supported
H2	Centralization	-.146	1.92	.028 **	Supported	-.095	1.06	.145	Not Supported
H3	Information Quality	.173	2.07	.019 **	Supported	.175	2.27	.011 **	Supported
H4	Procedural Quality	.210	2.41	.008 ***	Supported	.191	2.18	.015 **	Supported
H5	Rewards/Incetives	.289	3.47	.000 ***	Supported	.141	1.66	.048 **	Supported
H6	Collaboration					.279	2.95	.002 ***	Supported

*p <.10; **p <.05; ***p <.01

R^2 (adjusted) Collaboration: .50; S&OP Effectivenss: .52

DISCUSSION

Theoretical Implications

By employing a traditional input-process-output (IPO) model involving cross-functional S&OP teams, this study provided an opportunity to explore how group effectiveness principles behave in a new context. As previously alluded to, most group studies fail to include two-stage models involving both direct testing and indirect testing through a process variable (i.e. collaboration), thus hindering our ability to gain a more nuanced understanding of group phenomena. The testing of both direct and indirect relationships predictive of S&OP success in the same model is an initial step forward that will hopefully foster additional research and validation. Results confirm that collaboration is indeed an important component of S&OP success. Collaboration exhibited the most significant and meaningful direct relationship with S&OP effectiveness, while also partially facilitating a connection between group inputs and S&OP effectiveness. This is an important finding considering that the S&OP process involves several iterative steps that do not

necessarily involve collaboration. In retrospect, it is not surprising that both internal team predictors (social cohesion and centralization) did not exhibit significant direct effects with S&OP effectiveness because these are the socio-cultural predictors that would impact S&OP effectiveness primarily through the amount of collaboration that they foster.

Regarding model advancement, the IPO framework performed well with respect to explaining over half of the variance in both endogenous constructs: collaboration and S&OP effectiveness. This research extends our understanding of group effectiveness theory by incorporating a two-stage model and explicitly testing the degree in which the process variable, collaboration, mediated the associations between group inputs and overall S&OP effectiveness. Group researchers often fail to incorporate intervening process variables (Stock, 2004) or mistakenly assume, without testing, that process variables fully mediate the associations between inputs and outcomes (Ilgen et al., 2005). Results indicate that in an S&OP setting, contextual influencers of information quality, procedural quality, and joint rewards/incentives have both direct and indirect associations with the outcome of S&OP effectiveness. On the other hand, internal team factors of social cohesion and autonomy impact overall S&OP effectiveness primarily through collaboration. These findings support that associations within group research are indeed nuanced and researchers in other group settings are encouraged to include two-stage models and explicitly test for mediation. It is premature to assume that all internal team characteristics flow through an intervening process variable, but as researchers test more complex models of group effectiveness in different settings, patterns surrounding mediation effects may begin to emerge.

The results also shed light on the importance of two specific group inputs: autonomy and joint rewards/incentives that have exhibited mixed findings in other team settings. In fact, having joint rewards/incentives is a core tenet of Hackman's (1987; 1990) conceptualizations of group effectiveness; yet, it appears that firms are hesitant or often ineffective in designing meaningful group incentives. The joint rewards measure as evidenced in table 3 has the lowest mean value even when adjusting for differences in scale points, which supports other findings previously alluded to that cross-functional teams often do not receive group-based incentives. Also, this finding does not reinforce the reasoning offered by Oliva and Watson (2011) in their single company case study that a lack of joint rewards fosters higher levels of constructive engagement as groups seek to protect their functional interests. Additionally, as found in this study, the importance of simultaneously fostering group autonomy while also maintaining high levels of procedural quality bolsters similar findings in a cross-functional sourcing team context in which the authors noted a seeming contradictory need for both autonomy and formalization in order to achieve team effectiveness (Driedonks et al., 2014).

Managerial Implications

From a management perspective, this study lends empirical support for several of the principles such as achieving high levels of information quality and fostering collaboration that are ascribed to in the S&OP guidebooks (e.g. Wallace and Stahl, 2008). However, as management strategists note, collaboration is expensive, and should only be invoked when the potential benefits outweigh the associated costs (Rumelt, 2012). Given the time and resource pressures for part-time S&OP work, coupled with the potential distance of team members operating within complex global companies, managers need to know that the time spent away from the functional home on S&OP-related collaboration is worth it. Indeed, collaboration appears to be a key ingredient in driving S&OP effectiveness. In order to foster collaboration, S&OP managers need to promote an environment of collegiality, not competition, among team members. Within other group settings, too much collegiality can encourage groupthink leading to an incomplete review of potential choices and sub-optimal

decision making (Sethi et al., 2001). However, in an S&OP context, this does not appear to be an issue. It is likely that the very nature of competing agendas between demand and supply facing groups creates inherent tensions among S&OP team members to overcome. Hence, the more cohesion that teams are able to achieve, the more likely that they will effectively manage these inherent tensions and achieve higher levels of genuine collaboration.

This study also provides managers with additional insight concerning the level of decision-making control that should reside within S&OP teams. Although certain S&OP authors advance the importance of group autonomy (e.g. Lapide, 2004), there is also a strong push for direct involvement of top-level executives in the planning (e.g. Boyer 2009; Wallace & Stahl, 2008). Some experts even label the process as *executive* S&OP planning (Stahl, 2010). While emphasizing group-level autonomy and direct top management involvement in S&OP are by no means mutually exclusive principles, this study demonstrates that achieving the proper balance is important. As confirmed by the centralization scale, excessive meddling by top management in the decision making process can be troublesome, discouraging teams from achieving true collaboration. Instead, S&OP teams should be empowered to develop holistic solutions and only defer decisions to top management when group consensus cannot be reached.

At the same time, S&OP managers should be unyielding when it comes to ensuring both information and procedural quality. Poor forecast integrity is common among S&OP teams for a host of reasons (Stahl & Wallace, 2012). Yet, this study highlights that poor information quality not only directly hurts S&OP effectiveness, but impedes the ability of S&OP teams to achieve genuine collaboration. Also, managers can now draw on empirical evidence indicating that consistent S&OP procedures will strengthen both collaborative efforts and overall S&OP effectiveness. Aspects of S&OP procedural quality for managers to emphasize include knowing which information sources are to be used, having consistent process steps and report formats, and lastly, ensuring that S&OP teams adhere to a specific planning timetable.

Further still, managerial effort should be spent carefully designing incentive schemes, for this is the most significant driver of collaboration in the S&OP effectiveness model. While experts do not deny that incentive alignment is important, they clearly describe it as a condition that is more indicative of late stage S&OP maturity (Grimson & Pyke 2007; Wagner et al., 2014). Instead, more emphasis needs to be placed on trying to get the incentives aligned correctly at the outset of S&OP initiatives. Despite mixed findings in other team settings, the management axiom: "what gets measured gets rewarded, what gets rewarded gets done" (Moon, 2013, p. 111), clearly applies to S&OP teams. Tying a portion of sales managers' financial incentives to how the company performs on inventory management goals is one such mechanism that may help to keep sales engaged in the S&OP process. Similarly, tying a portion of operations managers' financial incentives to how the company performs on fill rates and customer satisfaction goals may help to keep operations focused on matters that are important to sales.

Limitations and Future Research

Although the inclusion of several industries and balancing of perceptions from both sides of the sales/operations divide are significant steps forward for S&OP research; this study has important limitations that should be noted. First, although key informant designs are common for team-based studies (*see* Akgün et al., 2012; Carbonell & Rodriguez, 2006; Sethi et al., 2001), the unit of analysis is individual perceptions of team dynamics which adds a layer of abstraction compared to studies that are able to capture entire team perceptions (e.g. Pinto et al., 1993). Also, related to team dynamics, it is common practice to include

team members in the S&OP process from the functional areas of marketing, sales, operations, finance, and sourcing, especially in larger companies (Wallace & Stahl, 2008). This study only captures perspectives from sales and operations functions. The literature review demonstrates that goal incongruence most often resides between these two functions. Nevertheless, the lack of full S&OP team assessment excludes the perspectives of team members from other functional areas that may be different from the core areas of sales and operations. Additionally, it is common practice for S&OP teams to incorporate members from suppliers and customers external to the firm (e.g. Tavares et al., 2012), or even to have multiple S&OP teams (e.g. Feng, D'Amours, & Beauregard, 2010), and this study does not address these complexities. Therefore, exercising caution is prudent when interpreting the generalizability of the results and additional validation is needed to move these findings beyond an exploratory state.

Given the nascent state of S&OP academic research, there is tremendous opportunity for future study as firms seek to optimize collaboration within their supply chains (Stank, Dittman, & Autry, 2011) and marketing has a critical role to play (Lambert & Cooper, 2000). Although this study was able to capture over 50% of explained variance in S&OP effectiveness, this leaves a significant portion to be explained by other factors. For example, one specific enabler not explored in this study is team leadership. Does it matter which functional area that the S&OP process owner hails from, or are there specific leadership skills that are needed to navigate cross-functional teams such as S&OP? These questions need to be addressed with further exploratory and empirical research.

Future research should seek to validate the findings of this study in a field setting. Ideally, perceptions can be captured from entire S&OP teams or at least paired responses from the same companies representing a wide set of industries. While a daunting task, if enough teams are surveyed the unit of analysis can shift from individual perceptions to team-level perceptions. Additionally, the involvement of entire teams opens up the possibility of gathering assessments of predictor variables from S&OP team members and assessments of effectiveness separately from the S&OP team leader.

In closing, the limited success of S&OP initiatives has led some scholars to advocate for more holistic forms of demand-supply integration (Moon, 2013). Exactly how demand-supply balancing should integrate with larger business and strategic planning initiatives is of increasing concern to both academics and practitioners alike (Wagner et al., 2014). The group effectiveness approach outlined here is also relevant to larger strategic conceptions such as business planning integration. In fact, one could argue that aspects such as social cohesion and procedural quality are even more important to achieve in settings involving additional stakeholder groups.

REFERENCES

Akgün, A. E., Keskin, H., Lynn, G., & Dogan, D. (2012). Antecedents and consequences of team sensemaking capability in product development projects. *R&D Management, 42*(5), 473-493.

Alexander, D. (2013). S&OP and strategy: Building the bridge and making the process stick. *The Journal of Business Forecasting, 32*(1), 16-19.

Arndt, A. D., Karande, K., & Landry, T. D. (2011). An examination of frontline cross-functional integration during retail transactions. *Journal of Retailing, 87*(2), 225-241.

Bagozzi, R. P. (1980). *Causal models in marketing.* New York, NY: John Wiley & Sons.

Bower, P., & Fossella, G. (2013). The S&OP Tension Convention: Two S&OP Pros Square Off on the Issue of Conflict within the Process. *Journal of Business Forecasting, 32*(4), 6-12.

Boyer Jr, J. E. (2009). 10 proven steps to successful S&OP. *Journal of Business Forecasting Methods and Systems, 28*(1), 4-7.

Byrne, T. M., Moon, M.A., & Mentzer, J.T. (2011). Motivating the industrial sales force in the sales forecasting process. *Industrial Marketing Management, 40*(1), 128-138.

Carbonell, P., & Rodriguez, A. I. (2006). Designing teams for speedy product development: The moderating effect of technological complexity. *Journal of Business Research*, *59*(2), 225-232.

Chase, Charles W., Jr. (2013). Putting "M"arketing back in S&OP. *The Journal of Business Forecasting, 32*(1), 4-7, 9-14.

Chimhanzi, J. (2004). The impact of integration mechanisms on marketing/HR dynamics. *Journal of Marketing Management*, *20*(7-8), 713-740.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern Methods for Business Research*, *295*(2), 295-336.

Cohen, S. G., & Bailey, D. E. (1997). What makes teams work: Group effectiveness research from the shop floor to the executive suite. *Journal of Management*, *23*(3), 239-290.

Denison, D. R., Hart, S. L., & Kahn, J. A. (1996). From chimneys to cross-functional teams: Developing and validating a diagnostic model. *Academy of Management Journal*, *39*(4), 1005-1023.

Dougherty, D. (1992). Interpretive barriers to successful product innovation in large firms. *Organization Science*, *3*(2), 179-202.

Driedonks, B. A., Gevers, J. M., & van Weele, A. J. (2014). Success factors for sourcing teams: How to foster sourcing team effectiveness. *European Management Journal*, *32*(2), 288-304.

Drucker, P.F. (1954). *The Practice of Management*. New York: Harper Business Press.

Feng, Y., D'Amours, S., & Beauregard, R. (2010). Simulation and performance evaluation of partially and fully integrated sales and operations planning. *International Journal of Production Research*, *48*(19), 5859-5883.

Ford, R. C., & Randolph, W. A. (1992). Cross-functional structures: A review and integration of matrix organization and project management. *Journal of Management*, *18*(2), 267-294.

Fornell, C., & Larcker, D. F., (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50.

Grimson, J. A., & Pyke, D. F. (2007). Sales and operations planning: an exploratory study and framework. *International Journal of Logistics Management, 18*(3), 322-346.

Hackman, J.R. (1987). *The Design of Work Teams*. In J.W. Lorsch (Eds.), *Handbook of Organizational Behavior*. (pp. 315-342). Englewood Cliffs, NJ: Prentice-Hall.

Hackman, J.R. (1990). Work Teams in Organizations: An Orienting Framework. In: *Groups that Work (and Those that Don't): Creating Conditions for Effective Teamwork*, ed. J.R. Hackman. San Francisco: Jossey Bass Publishers, 1–14.

Hackman, J. R., Wageman, R., Ruddy, T. M., & Ray, C. R. (2000). Team effectiveness in theory and practice. *Industrial and Organizational Psychology: Theory and practice*, Oxford, UK: Blackwell.

Hadaya, P., & Cassivi, L. (2007). The role of joint collaboration planning actions in a demand-driven supply chain. *Industrial Management & Data Systems*, *107*(7), 954-978.

Hage, J., & Aiken, M. (1967). Relationship of centralization to other structural properties. *Administrative Science Quarterly*, *12*(1), 72-92.

Hair, J. F., B. Black, B. Babin, & R. Anderson (2010). *Multivariate Data Analysis*. Upper Saddle River, N.J: Prentice Hall 7th edition.

Hair, J.F., Ringle, C.M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice, 19*(2) 139-151.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2013). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Thousand Oaks: Sage.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing (AIM)*, *20*, 277-320.

Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D. W., Ketchen, D. J., Hair, J. F., Hult, G. T. M., and Calantone, R. J. (2014a). Common Beliefs and Reality about Partial Least Squares: Comments on Rönkkö & Evermann (2013), *Organizational Research Methods, 17*(2): 182-209.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2014b). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1) 115-135.

Holland, S., Gaston, K., & Gomes, J. (2000). Critical success factors for cross-functional teamwork in new product development. *International Journal of Management Reviews, 2*(3), 231-259.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: Multidisciplinary Journal*, *6*(1), 1-55.

Hughes, D. E., Le Bon, J., & Malshe, A. (2012). The marketing–sales interface at the interface: Creating market-based capabilities through organizational synergy. *Journal of Personal Selling & Sales Management, 32*(1), 57-72.

Ilgen, D. R., Hollenbeck, J. R., Johnson, M., & Jundt, D. (2005). Teams in organizations: From input-process-output models to IMOI models. *Annu. Rev. Psychol.*, *56*, 517-543.

Iyengar, C., & Gupta, S. (2013). Building blocks for successful S&OP. *Supply Chain Management Review*, *17*(6), 11-17.

Jüttner, U., Christopher, M., & Baker, S. (2007). Demand chain management-integrating marketing and supply chain management. *Industrial Marketing Management*, *36*(3), 377-392.

Kahn, K. B., & Mentzer, J. T. (1998). Marketing's integration with other departments. *Journal of Business Research*, *42*(1), 53-62.

Lambert, D., & Cooper, M. (2000). Issues in supply chain management. *Industrial Marketing Management*, *29*(1), 65-83.

Lapide, L. (2004). Sales and operations planning part I: the process. The *Journal of Business Forecasting Methods & Systems*, *23*(3), 17-19.

Le Meunier-FitzHugh & Piercy, N. (2007). Does collaboration between sales and marketing affect business performance? *Journal of Personal Selling & Sales Management 27*(3), 207-220.

Li, S., & Lin, B. (2006). Accessing information sharing and information quality in supply chain management. *Decision Support Systems*, *42*(3), 1641-1656.

Liedtka, Jeanne M. 1996. "Collaborating across lines of business for competitive advantage." *The Academy of Management Executive* 10 (2): 20-34.

Lindell, M. K., & Whitney, D. J., (2001). Accounting for common method variance in cross-sectional research designs. *Journal of Applied Psychology*, *86*(1), 114-121.

Mathieu, J., Maynard, M. T., Rapp, T., & Gilson, L. (2008).Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future. *Journal of Management*, *34*(3), 410-476.

McClure, R. E. (2010). The influence of organizational culture and conflict on market orientation. *Journal of Business & Industrial Marketing*, *25*(7), 514-524.

McCormack, K., & Lockamy, A. (2005). The impact of horizontal mechanisms within sales and operations planning processes on supply chain integration and performance: a statistical study. In *4th Global Conference on Business & Economics, Oxford, UK*.

McGrath, J. E. (1964). *Social psychology: A brief introduction*. Holt, Rinehart and Winston.

Mello, J. (2010). Corporate Culture and S&OP: Why Culture Counts. *Foresight: The International Journal of Applied Forecasting*, *2010*(16), 46-49.

Mello, J. (2015). Internal and External Collaboration: The Keys to Demand-Supply Integration. *Foresight: The International Journal of Applied Forecasting*, (36), 16-20.

Menon, A., Jaworski, B. J., & Kohl, A. K. (1997). Product quality: impact of interdepartmental interactions. *Journal of the Academy of Marketing Science*, *25*(3), 187-200.

Mentzer, J. T., & Moon, M. A. (2004). Understanding Demand. *Supply Chain Management Review*, *8*(4), 38-45.

Min, S., Roath, A. S., Daugherty, P. J., Genchev, S. E., Chen, H., Arndt, A. D., & Richey, R. G. (2005). Supply chain collaboration: what's happening? *International Journal of Logistics Management*, *16*(2), 237-256.

Moenaert, R. K., Souder, W. E., De Meyer, A., & Deschoolmeester, D. (1994). R&D-marketing integration mechanisms, communication flows, and innovation success. *Journal of Product Innovation Management*, *11*(1), 31-45.

Montoya-Weiss, M. M., & Calantone, R. (1994). Determinants of new product performance: a review and meta-analysis. *Journal of Product Innovation Management*, *11*(5), 397-417.

Moon, M. A. (2013). *Demand and Supply Integration: The Key to World-Class Demand Forecasting*. New Jersey: FT Press.

Mowen, J. C., Fang, X., & Scott, K. (2009). A hierarchical model approach for identifying the trait antecedents of general gambling propensity and of four gambling-related genres. *Journal of Business Research*, *62*(12), 1262-1268.

Mullen, B., & Copper, C. (1994). The relation between group cohesiveness and performance: An integration. *Psychological Bulletin*, *115*(2), 210.

Muzumdar, M., & Fontanella, J. (2006). The secrets to S&OP success. *Supply Chain Management Review*, *10*(3), 34-41.

Nakano, M. (2009). Collaborative forecasting and planning in supply chains: The impact on performance in Japanese manufacturers. *International Journal of Physical Distribution & Logistics Management*, *39*(2), 84-105.

Nakata, C., & Im, S. (2010). Spurring Cross Functional Integration for Higher New Product Performance: A Group Effectiveness Perspective. *Journal of Product Innovation Management*, *27*(4), 554-571.

Olhager, J., & Selldin, E. (2007). Manufacturing planning and control approaches: market alignment and performance. *International Journal of Production Research*, *45*(6), 1469-1484.

Oliva, R., & Watson, N. (2011). Cross-functional alignment in supply chain planning: a case study of sales and operations planning. *Journal of Operations Management*, *29*(5), 434-448.

Pfeffer, J. (1981). *Power in organizations*. Marshfield, MA: Pitman.

Pinto, M. B., Pinto, J. K., & Prescott, J. E. (1993). Antecedents and consequences of project team cross-functional cooperation. *Management Science*, *39*(10), 1281-1297.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879-903.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior research methods, instruments, & computers*, *36* (4), 717-731.

Prokopets, L. (2012). S&OP: what you can learn from the top performers. *Supply Chain Management Review*, *16*(5), 28-35.

Ringle, Christian M., Wende, Sven, & Becker, Jan-Michael. (2014). Smartpls 3. Hamburg: SmartPLS. Retrieved from http://www.smartpls.com.

Rouziès, D., Anderson, E., Kohli, A. K., Michaels, R. E., Weitz, B. A., & Zoltners, A. A. (2005). Sales and marketing integration: a proposed framework. *Journal of Personal Selling & Sales Management*, *25*(2), 113-122.

Rumelt, R. P. (2012). *Good strategy/bad strategy: The difference and why it matters*. New York: Random House, Inc.

Sethi, R., Smith, D. C., & Park, C. W. (2001). Cross-functional product development teams, creativity, and the innovativeness of new consumer products. *Journal of Marketing Research*, *38*(1), 73-85.

Shapiro, B. P. (1977). Can marketing and manufacturing coexist? *Harvard Business Review*, *55*(5), 104-114.

Singh, M. K. (2010). What makes a winning S&OP program. *Supply Chain Management Review*, *14*(3), 22-27.

Sinha, D. (2015). How to Make the S&OP Process More Robust. *The Journal of Business Forecasting*, *34*(1), 14.

Smith, K. G., Smith, K. A., Olian, J. D., Sims Jr, H. P., O'Bannon, D. P., & Scully, J. A. (1994). Top management team demography and process: The role of social integration and communication. *Administrative Science Quarterly*, *39*(3), 412-438.

Song, X. M., Montoya-Weiss, M. M., & Schmidt, J. B. (1997). Antecedents and Consequences of Cross-Functional Cooperation: A Comparison of R&D, Manufacturing, and Marketing Perspectives. *Journal of Product Innovation Management*, *14*(1), 35-47.

Stahl, R. A. (2010). Executive S&OP: Managing to achieve consensus. *Foresight, Fall*, 34-38.

Stahl, R. A., & Wallace, T. F. (2012). S&OP Principles: The Foundation for Success. *Foresight*, (27) 29-34.

Stank, T. P., Dittmann, J. P., & Autry, C. W. (2011). The new supply chain agenda: a synopsis and directions for future research. *International Journal of Physical Distribution & Logistics Management*, *41*(10), 940-955.

Stewart, G. L. (2006). A meta-analytic review of relationships between team design features and team performance. *Journal of Management*, *32*(1), 29-55.

Stock, R. (2004). Drivers of team performance: What do we know and what have we still to learn? *Schmalenbach Business Review*, *56*(3), 274-306.

Tavares Thomé, A. M., Scavarda, L. F., Fernandez, N. S., & Scavarda, A. J. (2012). Sales and operations planning: A research synthesis. *International Journal of Production Economics*, *138*(1), 1-13.

Thomé, A. M. T., Scavarda, L. F., Fernandez, N. S., & Scavarda, A. J. (2012). Sales and operations planning and the firm performance. *International Journal of Productivity and Performance Management*, *61*(4), 359-381.

Thomé, A., Sousa, R., & Carmo, L. (2014). Complexity as contingency in sales and operations planning. *Industrial Management & Data Systems*, *114*(5), 678-695.

Thomé, A. M. T., Sousa, R. S., & Scavarda do Carmo, L. F. R. R. (2014). The impact of sales and operations planning practices on manufacturing operational performance. *International Journal of Production Research*, *52*(7), 2108-2121.

Tuomikangas, N., & Kaipia, R. (2014). A coordination framework for sales and operations planning (S&OP): Synthesis from the literature. *International Journal of Production Economics*, *154*, 243-262.

Trent, R. J. (1998). Individual and collective team effort: a vital part of sourcing team success. *International Journal of Purchasing and Materials Management*, *34*(4), 46-54.

Trent, R. J., & Monczka, R. M. (1994). Effective cross-functional sourcing teams: Critical success factors. *Journal of Supply Chain Management*, *30*(4), 2-11.

Vincent, L. H. (2010). The evolution of team processes in commercializing high-tech products. *Advances in the Study of Entrepreneurship, Innovation & Economic Growth*, *21*, 87-118.

Wagner, S. M., Ullrich, K. K., & Transchel, S. (2014). The game plan for aligning the organization. *Business Horizons*, *57*(2), 189-201.

Wallace, T. F., Stahl, Robert A. (2008). *Sales & operations planning: the" how-to" handbook*. TF Wallace & Co.

Wong, C., Skipworth, H., Godsell, J., & Achimugu, N. (2012). Towards a theory of supply chain alignment enablers: a systematic literature review. *Supply Chain Management: An International Journal*, *17*(4), 419-437.

Xie, J., Song, M., & Stringfellow, A. (2003). Antecedents and consequences of goal incongruity on new product development in five countries: A marketing view. *Journal of Product Innovation Management*, *20*(3), 233-250.