

Consensus on supplier selection objectives in cross-functional sourcing teams

Antecedents and outcomes

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Received 10 June 2014
Revised 2 December 2014
21 February 2015
6 May 2015
9 June 2015
Accepted 12 June 2015

Abstract

Purpose – A key driver of procurement effectiveness is the alignment of the procurement function with interlinked functions, such as R&D, engineering, production, and marketing. In the strategic management literature, the degree of alignment of individual team members on strategic objectives is termed “consensus.” The purpose of this paper is to investigate antecedents of consensus on objectives in cross-functional sourcing teams, the relationship between the degree of consensus and supplier performance, and moderators of the consensus-performance relationship. To do so, it ties strategic management literature to SCM and supplier selection research. As a result of these investigations, this research holistically introduces the concept of consensus to the discipline.

Design/methodology/approach – The study analyzes a sample of 88 sourcing teams (233 team members) from three manufacturing companies using regression analysis and moderated regressions.

Findings – Consensus on objectives for supplier selection among sourcing team members is positively related to the selection of higher performing suppliers. Sourcing team member experience is positively related to the level of consensus, and formalization of the selection process positively moderates the consensus-performance relationship. Team demographic diversity does not affect consensus among team members or supplier selection effectiveness.

Research limitations/implications – This study investigates consensus on objectives as a state within the sourcing team; it does not analyze how decision-making processes unfold in situations of low- or high-initial consensus among sourcing team members.

Practical implications – This paper provides insights into the drivers and effects of consensus on objectives and formalization of supplier selection in cross-functional setups.

Originality/value – This research addresses a gap in the SCM literature by investigating the role of consensus on objectives and thereby contributes to a better understanding of cross-functional sourcing team setups and effectiveness. The study introduces a key construct from the strategic management literature to supply management research, and empirical evidence shows how consensus can improve supplier selection performance.

Keywords Consensus, Supplier selection, Cross-functional team, Team diversity

Paper type Research paper

Introduction

As organizations increasingly rely on cross-functional sourcing teams to achieve superior purchasing performance, SCM research has begun addressing the procurement function's interactions with internal functions, such as R&D, engineering, production, finance, and marketing (Driedonks *et al.*, 2013; Stank *et al.*, 2011). Cross-functional team members integrate diverse perspectives and competencies during decision making, but they can also bring different priorities and objectives to the supplier selection process (Driedonks *et al.*, 2013; Schiele *et al.*, 2011). Without aligned objectives, team members from the various functions involved in cross-functional collaboration may be slow in making decisions, reach decisions not in line with the overall business strategy, and thus achieve suboptimal results (Martin and Holweg, 2011; Nath and Sudharshan, 1994).



The strategic management literature discusses alignment issues using the notion of consensus and has unpacked the construct into the two elements: consensus on competitive methods and consensus on objectives (Dess, 1987; González-Benito *et al.*, 2012; Kellermanns *et al.*, 2011). Neither element refers to “ongoing group processes” (Kellermanns *et al.*, 2011), but rather each denotes a status of alignment among team members, which is also referred to as the shared understanding of priorities (Kellermanns *et al.*, 2005).

The topic of consensus has been addressed in theoretical and empirical studies in the past decades (González-Benito *et al.*, 2012). This body of research has commonly focussed on the top management team as the locus of consensus (Knight *et al.*, 1999). However, more recent research has extended the study of consensus to the functional level (Homburg *et al.*, 1999), investigating consensus in sales teams (Ahearne *et al.*, 2010), in operations settings (Boyer and McDermott, 1999; Joshi *et al.*, 2003; Lindman *et al.*, 2001), and in the internal supply chain (Pagell and Krause, 2002). However, the role of consensus in cross-functional sourcing team decision making remains unexplored, despite being an organizational reality in many firms and despite the difference in thought worlds and priorities of the functional team members involved in such decisions (Driedonks *et al.*, 2013).

We address this gap by investigating consensus on the strategic objectives for a purchasing category (i.e. purchased item) by the cross-functional sourcing team members responsible for supplier selection in that category. In doing so, we make three main contributions to SCM research. First, this study integrates theory, conceptualizations, and findings on consensus from the strategic management literature into the supplier selection literature. Second, we extend research from the nascent stream of behavioral operations (Bendoly *et al.*, 2006) and follow the specific call for a team perspective in the field (Driedonks *et al.*, 2013; Riedl *et al.*, 2013). Third, we not only investigate the consensus-performance link and possible antecedents of consensus in sourcing teams (i.e. team member experience, team familiarity, and team demographic diversity) but also test for a moderation of the consensus-performance relationship through first, purchase item dynamism, to evaluate possible external influences, and second, formalization, to evaluate how internal institutions can affect the relationship. By doing so, we provide a clear framework that is based on the findings from the strategic management literature (Knight *et al.*, 1999), which we use to test both the input for and output of consensus in sourcing teams.

Theory and hypotheses

Consensus on supplier selection objectives and supplier performance

Supplier selection, one of the most critical activities of the procurement organization (González-Benito, 2007), is commonly the task of cross-functional sourcing teams (Driedonks *et al.*, 2013). In selecting suppliers, sourcing teams typically aim to achieve high performance along multiple dimensions, such as cost, delivery, quality, service, and innovativeness (Weber *et al.*, 1991).

Sourcing teams typically comprise team members from different functions to represent the objectives and thought worlds of a variety of stakeholders (Eltantawy *et al.*, 2014). An additional goal is to encourage deliberate discussions among team members in which team members explain, challenge, and contest each other’s opinions, ideas, and positions about a decision-making approach and about decision priorities and objectives (Simons *et al.*, 1999; Slotegraaf and Atuahene-Gima, 2011). Team-level debate should improve team performance for two reasons. First, as team members

challenge opinions and individual decisions, they are able to integrate their different perspectives and evaluate various solutions (Amason, 1996; Jehn, 1995). Second, debate of conflicting perspectives can raise questions and deliberations about whether the current supplier is adequate or whether a team member is biased (Kaufmann *et al.*, 2010). Debate can occur in the supplier selection context as team members focus on different priorities (e.g. cost savings, innovativeness, reliability) and try to achieve organizational ambidexterity (Raisch and Birkinshaw, 2008). Thus, a key benefit of debate is that it allows the integration of different knowledge sets (Driedonks *et al.*, 2013; Simons *et al.*, 1999) in selecting an adequate supplier. The role of the sourcing team and the dynamics within such teams have been the focus of recent supply management (Driedonks *et al.*, 2013; Kaufmann *et al.*, 2014) and industrial marketing (Patton and Balakrishnan, 2012) literature.

Consensus is the shared understanding among managers about the objectives for a specific task (Dess, 1987; Kellermanns *et al.*, 2005; Priem, 1990). The origins of research on consensus can be traced to the group decision-making literature (Stagner, 1969); since then, consensus has emerged as one of the most central concepts in predicting team performance. Furthermore, research on consensus has been critical to the evolution of strategic management theory because it is a critical concept for both the strategy process and strategy implementation literature (Kellermanns *et al.*, 2011). Consensus is a state; it does not refer to an ongoing team process (i.e. the building of agreement) (Kellermanns *et al.*, 2011). Consensus on objectives reflects the specific degree of agreement on objectives for a task within a group of managers (Dess and Origer, 1987; Floyd and Wooldridge, 1992; Kellermanns *et al.*, 2005; Wooldridge and Floyd, 1990). As such, it differs from previous terms used to describe agreement on strategy, such as “cohesiveness” (Kellermanns *et al.*, 2005; Stagner, 1969) and “shared strategic commitment” (Wooldridge and Floyd, 1989).

Although task-related characteristics, such as the nature of the sourcing category, the task environment, and information availability, can clearly influence the effectiveness of the sourcing team’s decision and supplier performance, a central hypothesis in the strategic management literature is that higher degrees of consensus are positively associated with internal effectiveness and organizational performance (González-Benito *et al.*, 2012; Kellermanns *et al.*, 2011). The underlying mechanism for this link is a shared understanding of the priorities and logic behind a decision, which improves coordination and cooperation through to implementation (Dess and Origer, 1987; Kellermanns *et al.*, 2005). Unforeseen issues, which frequently arise in sourcing contexts owing to market dynamics, supply disruption, and time pressure, must be resolved by individuals consistent with the intention of the team (Amason, 1996; Floyd and Wooldridge, 1992; Kellermanns *et al.*, 2011; Mintzberg *et al.*, 1976).

We follow this line of research and suggest that consensus on the objectives for a sourcing category and/or purchase item among cross-functional sourcing team members improves supplier selection effectiveness and thus enhances supplier performance for three-specific reasons. First, consensus among sourcing team members enhances effectiveness, as low levels of consensus can lead to decisions not in line with the overall sourcing strategy (Boyer and McDermott, 1999; Pagell and Krause, 2002). Second, a shared understanding of objectives improves coordination and cooperation through to the implementation of decisions (Dess and Origer, 1987; Kellermanns *et al.*, 2005). Third, low levels of consensus can negatively affect the commitment of sourcing team members, which, however, is crucial because a lack of commitment reduces active cooperation and support. In cross-functional sourcing teams, gaining the commitment of team members

who are usually assigned part-time to those teams is valuable because otherwise they might choose to focus on other projects (Englyst *et al.*, 2008; Trent and Monczka, 1994). Thus, consensus on objectives for supplier selection helps the functions involved collaborate with one another and work with suppliers toward the overall business strategy. Therefore, we hypothesize the following:

- H1. Consensus on objectives for supplier selection in cross-functional sourcing teams is positively related to supplier performance.

Antecedents of consensus for supplier selection: team experience, team familiarity, and team demographic diversity

Group decision-making theory (Stagner, 1969) suggests that a team's composition can affect the degree of consensus of team members on the objectives for a task and, ultimately, the team decision-making quality (Mathieu *et al.*, 2008). Work in this area has identified team member experience, team member familiarity, and team demographic diversity as important composition variables affecting consensus in groups (Knight *et al.*, 1999; Mathieu *et al.*, 2008). Based on upper-echelon theory (Hambrick, 2007; Hambrick and Mason, 1984), these variables are of paramount importance for group consensus on objectives because they indicate team homogeneity and social cohesion and thus indicate the perspectives team members bring to the group and how well they understand other perspectives (Kellermanns *et al.*, 2005).

Team experience is the collective, task-related experience of a team working together on a task (Huckman *et al.*, 2009). In a sourcing context, Riedl *et al.* (2013) propose a positive effect between individual experience and supplier performance. However, we suggest that in sourcing teams, the experience of the entire team is relevant in achieving consensus on objectives for the supplier selection. We hypothesize a positive relationship between sourcing team experience and consensus for three reasons. First, experience and repetition create routines and capabilities for making decisions that are in line with the goals of the organization (Huckman *et al.*, 2009). These capabilities are particularly relevant in cross-functional teams because individuals move from a functional to a team setting and, in doing so, must integrate diverse perspectives (Driedonks *et al.*, 2013). Second, experience in the selection of suppliers for a specific purchase item enhances understanding of the overall objectives for the respective procurement category. Furthermore, experience in supplier selection in a cross-functional setting improves understanding of the needs of other functions and especially of the internal customer (Driedonks *et al.*, 2013). Such an understanding of other stakeholders' objectives helps foster a shared understanding across the team. Third, managers with a longer tenure are more likely to be included in the strategy formulation process of their function (Joshi *et al.*, 2003). Thus, when the collective experience of a team is high, team members are likely to be more familiar with the purchasing category and share an understanding of the objectives for the supplier selection in that category. In addition, team experience increases trust among team members, which facilitates the exchange of information and allows for tested procedures (i.e. past project-related materials, a detailed description of analyses conducted, and documented learnings) (Easton and Rosenzweig, 2012). Therefore, we hypothesize the following:

- H2. Team experience is positively related to consensus on objectives for supplier selections in cross-functional sourcing teams.

Team familiarity refers to the extent to which members of the sourcing team know and have worked with one another in the past (Huckman and Staats, 2011; Kohli, 1989).

First, as team members share experiences in working together, they come to know one another's expertise, strengths, weaknesses, and priorities, which can enhance trust among them (Huckman and Staats, 2011). Team familiarity and trust promote interpersonal communication and tacit coordination among members (Huckman *et al.*, 2009), both of which lead to more aligned objectives (Weick and Roberts, 1993). Second, team familiarity increases individual team members' conformity to the team (Miron-Spektor *et al.*, 2011). Team members following a conforming approach commonly adhere to the formalized guidelines of the organization and the rules of the team. Third, team familiarity increases information gathering and the exchange of this information (Eisenhardt, 1989). Information sharing among team members increases the feelings of transparency and control of the team situation and thus leads to consensus on objectives (Tasa *et al.*, 2007). Therefore, we hypothesize that sourcing team members who have previously worked together have more consensus on the objectives for a subsequent supplier selection:

H3. Team familiarity is positively related to consensus on objectives for supplier selections in cross-functional sourcing teams.

Team demographic diversity is the extent to which teams are heterogeneous with regard to team member demographics, including age, gender, nationality, and level of education. Therefore, the term refers to the degree of objective differences among individuals in a group (Kearney and Gebert, 2009).

Various studies have investigated both the positive and negative effects of team demographic diversity, specifically examining the diversity-performance relationship by accounting for contingencies of the task (van Knippenberg *et al.*, 2011). On the one hand, positive effects of diversity derive from the assumption of information processing theory that teams make better decisions when integrating diverse perspectives, knowledge, expertise, information, and ways of processing information (Kearney and Gebert, 2009). On the other hand, the social categorization perspective predicts a negative effect of diversity on team performance resulting from lower levels of collective team identification (Kearney and Gebert, 2009).

Following the social categorization perspective, we suggest that demographically diverse sourcing teams are less likely to share an understanding of objectives for supplier selection (Driedonks *et al.*, 2013; Knight *et al.*, 1999). That is, we assume that the decision about which objectives to focus on in the supplier selection is consistent with psychological characteristics, which are shaped by demographic characteristics (Hambrick and Mason, 1984). When these characteristics differ, so should the objectives for the supplier selection. Furthermore, diversity leads to lower levels of team cohesion, which hampers communication among team members and identification with the sourcing team (Thatcher and Patel, 2011; Webber and Donahue, 2001). However, as noted previously, higher levels of communication and identification with the team promote consensus. Therefore, we hypothesize the following:

H4. Team demographic diversity is negatively related to consensus on objectives for supplier selections in cross-functional sourcing teams.

Moderators of the consensus-performance relationship: purchase item dynamism and supplier selection formalization

Findings on the consensus-performance relationship from various contexts have been inconsistent, highlighting a pressing need to investigate moderator variables (González-Benito *et al.*, 2012; Homburg *et al.*, 1999; Kellermanns *et al.*, 2011). Important performance contingency factors relate to the group structure – freedom of action

paradigm (Priem, 1990). This research stream emphasizes the importance of environmental dynamism and group structures for the consensus-performance relationship.

Extant literature has extensively examined environmental dynamism as a moderator of the consensus-performance link, finding varying results (Dess and Origer, 1987; Homburg *et al.*, 1999). Because the settings in which supplier selections are made vary substantially between industries and categories, we regard purchase item dynamism as one important moderator of the consensus-supplier performance relationship. In general, dynamism refers to the degree of unpredictable change in the environment, product, or customer requirements (Dess and Origer, 1987). In dynamic sourcing settings, the consensus-performance relationship might be weaker than in stable environments because dynamism increases the frequency of change and, thus, the range of strategic options (Acur *et al.*, 2012). In such circumstances, sourcing team members are more likely to alter their objectives from one supplier selection to the next. With this lack of consistency and limited predictability of supplier selection outcomes, the consensus-performance relationship becomes weaker under dynamic sourcing settings. In dynamic settings, high levels of consensus also might undermine an organization's ability to recognize the need for change, to question existing objectives, or to explore alternative suppliers (González-Benito *et al.*, 2012; Priem, 1990). Therefore, less consensus on objectives and subsequently more debate over diverse opinions regarding sourcing priorities could be advantageous in dynamic contexts because more debate might lead to more innovative solutions and flexibility in the selection of suppliers (Eisenhardt, 1989; González-Benito *et al.*, 2012). Consistent with prior research (Kellermanns *et al.*, 2011), we propose that purchase item dynamism negatively moderates the consensus-performance relationship in the supplier selection context:

- H5.* Purchase item dynamism moderates the consensus-performance relationship. Specifically, the higher purchase item dynamism, the weaker is the consensus-performance relationship.

According to recent SCM research (Driedonks *et al.*, 2013), organizational variables such as formalization can also affect team performance (Joshi *et al.*, 2003; Kellermanns *et al.*, 2005). Formalization reflects a high degree of explicitly articulated and written rules, policies, and procedures. The formalization of tasks and decisions can play an important role in team performance because it limits flexibility regarding the makeup of the team and how the team interacts (Baum and Wally, 2003). Formalization should strengthen the relationship between initial consensus on objectives and supplier performance because subsequent decision processes will be structured and well documented, which prevents the loss of information and allows for a clear translation of shared objectives into key performance indicators for managing the subsequent supplier relationship. Thus, supplier selection formalization is likely to have a positive influence on implementation. Therefore, we hypothesize the following:

- H6.* Supplier selection formalization moderates the consensus-performance relationship. Specifically, the higher supplier selection formalization, the stronger is the consensus-performance relationship.

Methodology

Research design and data collection

The unit of analysis in this study is the cross-functional sourcing team that was set up to make a supplier selection decision within a specific procurement category.

The immediate outcome of the supplier selection by the cross-functional sourcing team is the performance of the selected supplier (Hunter *et al.*, 2006). The rationale behind this approach is that decisions made at lower levels of the organizational hierarchy are directly linked to their immediate outcomes rather than to the overall performance of the organization (which is commonly used as an outcome measure in studies on top management team decision making). In particular, the effect of other influencing factors on supplier performance is likely to be smaller, and the time lag between the decision and the effect is likely to be shorter (Kaufmann *et al.*, 2012). Therefore, respondents were asked to complete an online survey referring to a specific supplier selection that fulfilled the following five criteria: first, the supplier selection was finalized within the past 12 months (to reduce retrospective bias); second, the purchase item was procured on a regular basis (no one-off items, such as capital investments), so that respondents could assess the quality, service, and delivery performance of the supplier; third, the supplier selection focussed on awarding the business to a new supplier (i.e. a prior long-term relationship could be neglected); fourth, at least two team members were involved, to ensure that the supplier selection was a group effort; fifth, the respondents were all deeply involved in the supplier selection process, including making the final decision; and sixth, the supply base was large enough to ensure sufficient alternatives (no supplier was a priori the obvious choice).

To ensure content validity and reduce common method bias, we selected all members of the cross-functional sourcing team actively involved in the supplier selection as key informants (Hunter *et al.*, 2006) because each team member is commonly responsible for a specific aspect of the supplier selection and performance and the members made a joint supplier selection decision (Driedonks *et al.*, 2013). In total, 233 team members from 88 sourcing teams at three different companies participated in this research. The companies included one Fortune Global 500 consumer and industrial goods company, one medium-sized pharmaceutical company, and one medium-sized producer of white goods. With the support of the chief procurement officer at the companies, we obtained a list of supplier selection decisions from every purchasing category in the firm. The lists also contained the involved team members' names, contact information, and function; the item category; the project name or number; the supply base; the annual purchasing spend; and the duration of the decision-making process. The final list contained 99 supplier selections and the names of 278 sourcing team members. All team members listed received an invitation to participate in an online survey. Additional information about the specific supplier selection (i.e. project name, start of supplier selection process, finalization of supplier selection, and names of other team members involved) was provided to ensure that all team members recalled the focal supplier (Podsakoff *et al.*, 2003). Furthermore, all respondents were guaranteed absolute anonymity to ensure they answered as honestly as possible (Podsakoff *et al.*, 2003). To reduce priming effects, we varied the order of the input, process, and output variables (Podsakoff *et al.*, 2003). After finalization of the data collection procedure, 244 team members from 99 sourcing teams had participated in the survey, for a response rate of 88 percent. Answers from 11 teams were excluded from the final sample because they featured responses from only one team member. Table I provides the characteristics of the sourcing teams included in the study. In line with group decision-making theory, teams are a group of two or more individuals who pursue a common goal (e.g. selecting a supplier) (Salas *et al.*, 1997). Cross-functional teams are commonly temporary work groups from two or more organizational units

or functions (Denison *et al.*, 1996). The average size of the sourcing teams in our sample was close to three; more than one-third of team members came from the procurement function, and one-quarter came from the technical R&D or engineering function.

To ensure that items were clear, concise, and specific (Podsakoff *et al.*, 2003), we conducted pre-test interviews with five supply management scholars and eight managers. We assessed non-response bias and tested for significant differences on key variables between easily convinced respondents whose participation was more immediate and respondents whose participation required additional urging (Clotey and Grawe, 2014). To this end, we compared the key variables for early respondents (i.e. those who answered before the first reminder) and late respondents (i.e. those who answered after the first reminder) (Armstrong and Overton, 1977). The results revealed no significant differences between early and late respondents.

We controlled for common method bias both by using multiple key informants and through the study's procedures (Ellis *et al.*, 2010; Saw and Kaufmann, 2014). The project was labeled as research on the optimization of the supplier selection process, rather than research on consensus. Thus, we avoided drawing respondents' attention to the relationships between objectives and supplier performance. Moreover, we organized the questions so that the dependent variables were separate from the independent variables, thus preventing respondents from developing their own theories about possible cause-effect relationships (Podsakoff *et al.*, 2003). Furthermore, respondents were assured of strict confidentiality and anonymity (Podsakoff *et al.*, 2003). As a statistical means to control for common method bias, we used the single-method factor approach (Podsakoff *et al.*, 2003) and found no indication of it.

The average time that had elapsed between the finalization of the supplier selection and participation in the survey was seven months. This duration was necessary to ensure that participants could adequately evaluate the performance of the supplier. Because of the lapsed time, we tested whether problems recalling the decision had a significant effect on the data (Srinivasan and Ratchford, 1991). We split the sample into three groups of similar size: decisions finalized in the past four months, decisions made four to eight months before survey completion, and decisions made more than eight months before. The results of the test showed no significant differences across these three groups on key variables of the study.

Measures

We operationalized consensus on objectives for the supplier selection as the agreement of team members on the importance of their priorities for the supplier selection process.

Sample characteristics

Sample size	88 teams (233 participants)
Function	37.3% purchasing; 25.8% R&D/engineering; 13.6% logistics; 14.0% other function
Gender	74.2% male; 25.8% female
Age	8.1% under 30; 17.9% 30-35; 17.9% 36-40; 18.8% 41-46; 15.8% 46-50; 14.1% 51-55; 7.4% over 55
Tenure	0.4% up to 6 months; 6.8% 7 months-2 years; 15.8% 3-5 years; 20.5% 6-10 years; 16.7% 11-15 years; 9.9% 16-20 years; 29.9% more than 20 years
Education	26.5% high school graduates; 16.2% BA/BSc degrees; 44.0% MA/MSc degrees; 13.2% PhD degrees

Table I.
Sample
characteristics

Previous research has employed various techniques, but the most common technique is to calculate the standard deviation across individual members of the sourcing team for each possible objective. The mean of these standard deviations represents a team-level consensus score. A low score therefore indicates a high degree of consensus. We selected the eight most common priorities for supplier selection on the basis of both a literature review (Weber *et al.*, 1991; Wu and Pagell, 2011) and the pre-tests with managers.

To operationalize sourcing team decision-making effectiveness, typically both financial and non-financial performance indicators of the selected suppliers are assessed (Cai and Yang, 2008; Shin, 2000). Financial performance mainly pertains to cost (Talluri, 2002). Non-financial performance addresses delivery, service, and quality aspects (Verma and Pullman, 1998; Weber *et al.*, 1991). We built the final scale on eight of the most important vendor selection criteria as classified by Weber *et al.* (1991) and supplier performance items as developed by Wu *et al.* (2010). Survey participants were asked to compare the performance of the supplier with their expectations of the performance before the supplier selection decision was made (Cronin and Taylor, 1994). The supplier performance scale exhibited sufficient inter-rater agreement (median rwg 0.93) (James, 1982), justifying aggregation of the individual responses to the team level by averaging the scores across teams.

We operationalized team experience and team familiarity by building on existing scales (Dayan and Di Benedetto, 2011; Kohli, 1989). Both team expertise and team familiarity scales exhibited sufficient inter-rater agreement (median rwg 0.87 and rwg 0.91, respectively) (James, 1982), justifying aggregation of the responses to the team level.

We drew four measures of demographic diversity (i.e. gender, nationality, age, and educational level) from prior studies on work teams (Knight *et al.*, 1999; Simons *et al.*, 1999). To measure these factors, we asked team members to indicate their gender (male or female), nationality (local vs foreign employee), age, and education level (1 = no degree obtained, 6 = PhD degree). We calculated the diversity measures in terms of Blau's (1977) heterogeneity index, $(1 - \sum p_i^2)$, where p_i is the proportion of category i in the group. Blau's index is the most commonly used measure to capture diversity distinctions in a group (Biemann and Kearney, 2010; Blau, 1977; Harrison and Klein, 2007). A high score on this index indicates high variability in demographic characteristics among team members, while a low score represents greater demographic homogeneity.

We measured both moderators (i.e. purchase item dynamism and formalization) using existing scales (Baum and Wally, 2003; Kaufmann and Carter, 2006). Our purchase item dynamism scale exhibited sufficient inter-rater agreement (median rwg 0.82) (James, 1982), justifying aggregation of the responses to the team level. The supplier selection formalization scale also exhibited sufficient inter-rater agreement (median rwg 0.82) (James, 1982), again justifying aggregation of the responses to the team level. Three items showed factor loadings slightly below the most common threshold of 0.5. However, for reasons of content validity and because the factor loadings were only marginally below the threshold, we included the respective items in the subsequent analysis.

Table II provides a comprehensive overview of all scales and items used. All scales exceeded the recommended threshold of 0.6 for composite reliability (Jun *et al.*, 2006) and showed good values for the coefficient α .

Results

Table III summarizes the means, standard deviations, and correlations among the research variables at the team level. To test *H1-H4*, we employed regression analysis

Constructs and scale items	SFL	Consensus on supplier selection	
<i>Team experience (CR = 0.83; $\alpha = 0.82$)</i>			
The team members had a lot of experience regarding the purchase item	0.77	783	
There was a critical mass of experienced people on the team who had been involved in processes with this or similar items before	0.64		
The team members were competent to make an assessment of the purchase items	0.72		
The team members brought with them a wealth of knowledge about the purchase item gained from prior similar processes	0.84		
<i>Team familiarity (CR = 0.94; $\alpha = 0.94$)</i>			
The team members knew each other well	0.85		
The team members could build upon past experience in working together	0.92		
The team members were familiar with each other's way of working	0.92		
The team members had known each other for a long time	0.87		
<i>Consensus on objectives for supplier selection</i>			
How important were the following objectives to you in this supplier selection process?			
Low total cost of ownership for the purchase item			
High purchase item quality			
Low purchase item price			
On-time delivery of purchase item			
High innovativeness of supplier			
High technical capability of supplier			
Good service and/or technical support by supplier			
Good responsiveness of supplier to requests for changes (volumes/specifications)			
<i>Item dynamism (CR = 0.79; $\alpha = 0.78$)</i>			
Changes in the item specification have been difficult to predict in the past	0.52		
The item specification was subject to frequent technological developments	0.75		
Past changes in performance requirements of the purchase item were substantial	0.76		
The item was subject to more technological changes than other items our organization has purchased	0.74		
<i>Supplier selection formalization (CR = 0.74; $\alpha = 0.73$)</i>			
Manuals and written guidelines are followed in such processes	0.79		
Highly formalized channels of communication are followed in such processes	0.89		
I am not "on my own" in making decisions	0.45		
Such processes involve a great deal of paperwork and administration	0.45		
Important events are documented by memo (e.g. online systems) during such processes	0.36		
<i>Supplier performance (CR = 0.86; $\alpha = 0.85$)</i>			
Low total cost of ownership for the purchase item	0.32		
High purchase item quality	0.80		
Low purchase item price	0.36		
On-time delivery of purchase item	0.60		
High innovativeness of supplier	0.66		
High technical capability of supplier	0.77		
Good service and/or technical support by supplier	0.84		
Good responsiveness of supplier to requests for changes (volumes/specifications)	0.82		
Notes: α , Coefficient alpha; SFL, standardized factor loading; CR, composite reliability			

Table II.
Constructs and scale items

(Table IV), and to test *H5* and *H6*, we used moderation analysis (Table V). This procedure is in line with prior research in the field of strategic management on consensus (Homburg *et al.*, 1999). As predicted, the correlations between consensus on objectives for supplier selection and supplier performance (*H1*) and between team

Table III.
Means, standard deviations, and correlations

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Team experience	5.6	0.76	1.00									
2. Team familiarity	4.9	1.2	0.49**	1.00								
3. Gender diversity	0.19	0.23	-0.11	-0.20	1.00							
4. Nationality diversity	0.11	0.20	-0.12	-0.19	0.17	1.00						
5. Age diversity	0.94	0.04	0.11	0.10	-0.21*	-0.16	1.00					
6. Educational diversity	0.91	0.8	0.08	0.07	-0.11	-0.21*	0.77**	1.00				
7. Consensus	0.84	0.41	-0.22*	-0.16	0.09	-0.30	-0.22*	-0.09	1.00			
8. Dynamism	3.7	0.77	-0.29**	-0.10	-0.02	0.05	-0.11	-0.11	-0.01	1.00		
9. Formalization	5.1	0.68	0.23*	0.26*	-0.03	-0.03	0.13	0.12	-0.22*	0.04	1.00	
10. Supplier performance	5.4	0.64	0.44**	0.35**	0.04	-0.06	0.11	0.11	-0.44**	0.00	0.31**	1.00

Notes: Correlations are shown below the diagonal. SD, standard deviation. $n = 88$ teams. * $p < 0.05$; ** $p < 0.01$

Table IV.
Regression analysis

Variables	β	R^2	ΔF
<i>H1: consensus-performance relationship</i> Consensus	-0.437**	0.191	20.250**
<i>H2: team experience-consensus relationship</i> Team experience	-0.219*	0.048	4.341*
<i>H3: team familiarity-consensus relationship</i> Team familiarity	-0.161	0.026	2.302
<i>H4: team diversity-consensus relationship</i> Gender diversity	0.047	0.067	1.480
Nationality diversity	-0.058		
Age diversity	-0.352*		
Educational diversity	0.177		

Notes: $n = 88$ teams. * $p < 0.05$; ** $p < 0.01$

experience and consensus (*H2*) were significant. The results of the regression analysis show that consensus explained 19 percent of the variance ($R^2 = 0.19$, $F(20, 25)$, $p < 0.01$) of supplier performance and team experience explained 5 percent of the variance ($R^2 = 0.0489$, $F(4, 34)$, $p < 0.05$) of consensus. However, contrary to *H3*, we found no significant relationship between team familiarity and consensus. Furthermore, we found no negative effects of the demographic diversity measures on consensus; thus, *H4* was not supported. Gender, nationality, and educational diversity showed no significant relationship to consensus on objectives, while age diversity showed a positive relationship to consensus.

Regarding the moderating effects (*H5* and *H6*), we tested both hypotheses using Baron and Kenny's (1986) suggested approach. We first created interaction terms (consensus \times purchase item dynamism and consensus \times supplier selection formalization) by using standardized variables. In a hierarchical regression analysis, we then tested whether the addition of the product term to the consensus-performance relationship

Variables	β	ΔR^2	ΔF	Consensus on supplier selection
<i>First step: item dynamism</i>				
Consensus	-0.437**	0.191	10.007**	
Dynamism	0.00			
<i>Second step: item dynamism</i>				
Consensus	-0.401	0.008	0.853	
Dynamism	0.016			
Consensus \times dynamism	0.098			
<i>First step: supplier selection formalization</i>				
Consensus	-0.388	0.236	13.111**	
Formalization	0.218			
<i>Second step: supplier selection formalization</i>				
Consensus	-0.443**	0.043	5.023*	
Formalization	0.186			
Consensus \times formalization	-0.216*			

Notes: $n = 88$ teams. * $p < 0.05$; ** $p < 0.01$

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Table V.
Moderation analysis

resulted in a significant change in R^2 (Baron and Kenny, 1986). Contrary to $H5$ and previous findings, dynamism had no moderating effect. However, the analysis provides support for $H6$; formalization positively moderates the consensus-performance relationship. A summary and visual representation of our hypotheses can be found in Figure 1.

Discussion

This research examined the importance of consensus on objectives in cross-functional sourcing teams for supplier performance. Furthermore, the study analyzed antecedents of sourcing team consensus (i.e. team experience, familiarity, and demographic diversity) and moderators of the consensus-performance relationship (i.e. purchase item dynamism and supplier selection formalization), using a sample of 233 members from 88 cross-functional sourcing teams. By doing so, we introduced the concept of consensus holistically to the supply chain management discipline.

This study was inspired by the strategic management literature, in which consensus on objectives is a central construct. The role of consensus on objectives within cross-functional sourcing teams as an antecedent for supplier selection effectiveness has not been investigated previously. This gap in the SCM literature is surprising, given the

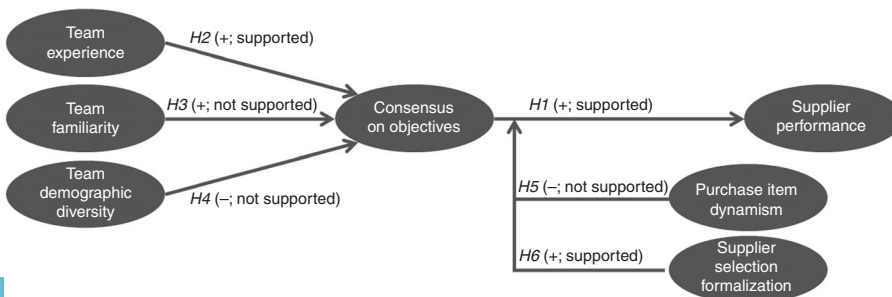


Figure 1.
Research model

increasing emphasis on cross-functional collaboration in recent procurement transformations (Cantor *et al.*, 2013). Therefore, this research makes several important contributions.

First, the study's main contribution lies in bringing the discussion on team consensus on objectives to the SCM literature. This study addresses the team as the unit of analysis, and the results at this level indicate that consensus among cross-functional team members is essential in selecting suppliers. The finding of a positive relationship between consensus on objectives and performance validates a key tenet in the strategic management literature and shows that this relationship also applies to the ambidextrous objectives for supplier selection and the very diverse thought worlds within sourcing teams. Furthermore, these results indicate the necessity of extending research on team- and individual-level variables in the field. These results also lend weight to the arguments brought forth by the emerging research stream termed "behavioral operations," which emphasizes the importance of behavioral factors in supply chain management decision making. However, while we show that consensus on objectives is an important antecedent for sourcing team effectiveness, the group decision-making literature also shows that putting too much emphasis on group harmony can hinder constructive criticism, which is also necessary in sourcing teams (Kellermanns *et al.*, 2011).

Second, our results are contrary to those of previous studies that show that team demographic diversity is negatively related to consensus. Most demographic diversity variables had no significant relationship to consensus in our study. Thus, our research suggests that differences in demographics do not necessarily mean that sourcing team members hold different objectives. This notion lends some support to previous upper-echelon research that suggests that the effects of demographic diversity are too weak to be detected consistently and that demographic diversity has only an indirect effect (through cognitive diversity) on outcomes (Miller *et al.*, 1998). Furthermore, research in the field of organizational behavior has identified diversity measures relevant for performance outcomes in work groups. That research suggests that, for example, both functional and educational diversity leads more to team cohesion and performance than ethnic or gender diversity, which is more likely to result in emotional conflict (Webber and Donahue, 2001). However, diversity in age among team members, surprisingly and contrary to our assumptions, had a positive relationship to consensus on objectives for cross-functional supplier selections. This positive relationship between age diversity and consensus likely emerged because age similarity in teams increases emotional conflict. Team members compare their own status with employees of a similar age group, thus increasing rivalry, conflict, and political games, which in turn might lead to low consensus (Wiersema and Bantel, 1992).

Third, we found that team experience had a significant, positive relationship to consensus on objectives while team familiarity had no significant effect. Thus, the results indicate that the task-related experience of teams is more relevant for consensus on supplier selection objectives than member-related familiarity. This finding likely emerged because experienced teams more comprehensively understand and share the firm's overall strategic priorities and can translate them into functional and supplier selection objectives (Walter *et al.*, 2013). To verify this inference, we revisited the three companies in our sample and conducted follow-up interviews with three members of the respective procurement leadership teams. These interviews provided evidence to support our *post hoc* supposition about the lack of a relationship between team familiarity and consensus. The managers noted that experienced team

members perform their tasks equally well, regardless of team composition in terms of member-related attributes such as familiarity or diversity. However, the respondents stressed that such performance might be different in emerging market contexts and, therefore, that communication along vertical and horizontal dimensions was important, especially as companies grow and mature (Kathuria *et al.*, 2007).

Fourth, contrary to *H5* and previous findings in the strategic management literature (Kellermanns *et al.*, 2011), we found no moderating effect of purchase item dynamism on the consensus-performance relationship. This finding is not entirely surprising in light of previous inconsistent findings (Dess, 1987; Kellermanns *et al.*, 2011). An explanation might be that the criteria and priorities for the supplier selection are not primarily dependent on environmental circumstances but also depend on organizational goals and purchasing categories. During our follow-up interviews, the informants also stressed that high degrees of dynamism and extreme market volatilities were the “new normal” and that they expected their sourcing teams to be more resistant to volatility than they were five to eight years ago.

Fifth, and in line with *H6*, formalization of the supplier selection process served as a positive moderator of the consensus-performance relationship. This finding provides further evidence of the importance of formalizing decision-making processes when different functions are involved (Paulraj *et al.*, 2006; Wong *et al.*, 2011). This finding also provides organizations with a tangible starting point to improve cross-functional supplier selections.

Limitations and further research

The findings show how factors related to institutional and individual contexts affect consensus on objectives in cross-functional sourcing teams and, consequently, supplier selection effectiveness and performance. The following limitations of our study can help guide further research in this area. First, our study focussed exclusively on supplier selection decisions, which admittedly is the most regular and important task of the purchasing function but nevertheless is only one task. Further research could try to extend our findings to other decisions, such as supplier development or make-or-buy decisions, to holistically evaluate the role of consensus in cross-functional procurement contexts. Second, we limited our study to three antecedents of consensus on objectives and two moderators of the consensus-performance relationship. Further research could include other variables to gain a more comprehensive understanding of the complex consensus-performance relationship. For example, more recent team composition literature suggests that deep-level composition variables, such as personality traits, need to be taken into account when examining the effect of diversity on team decision making (Bell, 2007). Third, our research included sourcing team members from both the USA and Europe. Thus, a study focussing on less mature markets could provide further insights (e.g. on the moderating role of environmental dynamism). Fourth, our supplier performance measures were based on managers' evaluations of suppliers' performance. Further research might lend support to the current findings by using multiple measures, including objective data on supplier performance. Fifth, we recognized the time lag between formulating the objectives for supplier selection and measuring supplier performance and accordingly asked respondents to evaluate the decision and supplier performance a few months after the decision was made. However, a longitudinal study could provide more precise results. For example, a longitudinal study incorporating cognitive maps would enable analysis on how the degree of consensus in sourcing teams develops over time. The next step in this line of research

would be to qualitatively investigate whether sourcing team members make trade-offs between objectives (e.g. low-purchase item price and high-supplier innovativeness) and, if so, are able to come to consensus on objectives. Finally, this study is based on the analysis of three companies, and thus the generalizability of our findings across companies is limited. Our approach, however, is corroborated by researchers such as Wu *et al.* (2010) and Miron-Spektor *et al.* (2011), who use small samples of companies to gain a deeper and richer understanding of a phenomenon when empirical research is in its infancy. Furthermore, all the teams were from only three organizations, all headquartered in the same country, which helped us limit potentially confounding factors, such as corporate cultures or markets. However, we encourage research to use larger samples of teams, organizations, and industries to add to the generalizability of the findings and to reveal their boundary conditions.

Practical implications

From a practical perspective, our results lead to several implications for both fundamental transformations and incremental improvements of procurement organizations.

First, it is not enough for managers from various functions to collaborate on and participate in the selection of suppliers. Rather, sourcing team members should align on common objectives and specific priorities for each supplier selection. Achieving consensus during goal alignment meetings at the beginning of the supplier selection phase is essential, though it can also be beneficial as early as in the problem definition or solution identification stage (Schmidt *et al.*, 2015). Recent research (Riedl *et al.*, 2013) suggests that breaking down the supplier selection process into sub-processes leads to improved decision making; consequently, goal alignment should be the first sub-process. During the initiation process, cross-functional category teams should review the soundness of category-specific objectives and strategies and emphasize the importance of improving not only the value of their own function but also that of other functions to find the best suppliers for their organization. Such meetings could also help improve cross-functional communication in general (Kellermanns *et al.*, 2011). As a by-product, this improved communication and consensus on objectives might also lead to increased satisfaction among sourcing team members (Beehr *et al.*, 2009). Second, the positive effect of experienced team members on consensus on objectives and consequently supplier performance should not be underestimated. This positive effect stems from the likelihood that experienced team members fully comprehend the overall organizational and functional strategies and objectives (Kathuria *et al.*, 2007). Furthermore, experienced team members are more likely to act as mobilizers to achieve consensus within the team (Schmidt *et al.*, 2015). Therefore, including experienced employees in sourcing teams should enhance cross-functional decision-making effectiveness. Finally, as indicated, both supply management researchers and practitioners have focussed primarily on optimizing the strategic sourcing process and the manner in which procurement organizations interact with their suppliers. However, the trend in the past ten years of integrating the procurement function and formalizing cross-functional sourcing processes not only has validity but also can improve bottom-line results substantially. Supplier selection formalization both enhances compliance and improves cross-functional effectiveness. Therefore, organizations should not stop at implementing cross-functional teams but should clearly determine the structures and processes on which these teams collaborate.

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