# Social Networks and Group Effectiveness: The Role of External Network Ties

**Fabiola Bertolotti and Maria Rita Tagliaventi**

**Abstract** This research explores the relationship between group effectiveness and social networks. Through a 5-month ethnographic observation within three work groups employed in one of the major Italian fashion firm, we recorded all interactions occurring within the groups and outside the groups' boundaries, thereby deriving the enacted communication network. Then, by means of structured interviews, we collected evaluations of group effectiveness. The evaluations given to the three groups differ and such difference cannot be traced back to the amount of communication network activated nor to the level of group members' competencies, nor to their internal network structure. The field evidence suggests that the better evaluation received by one group relates to the quality of the relationships it sets up with external actors. This group assumes a coordinating role in the whole product development process: in particular, it spontaneously triggers, through reciprocal interactions, modalities of collaborative design, not formally required, which are rewarded by organizational members' higher evaluations. The study has implications for social networks research by pointing to the importance to grasp the actual content of network relationships, thus going beyond the assessment of their presence and/or strength, in order to fully comprehend how network ties really influence organizational members' perceptions and actions.

F. Bertolotti (✉)
DISMI, University of Modena and Reggio Emilia, Reggio Emilia, Italy
e-mail: fabiola.bertolotti@unimore.it

M.R. Tagliaventi
Department of Management, University of Bologna, Bologna, Italy
e-mail: maria.tagliaventi@unibo.it

Ş. Gündüz-Öğüdücü and A.Ş. Etaner-Uyar (eds.), *Social Networks: Analysis and Case Studies*, Lecture Notes in Social Networks, DOI 10.1007/978-3-7091-1797-2_5,

## 1 Introduction

Organizations intensively employ work teams to perform knowledge intensive and creative tasks, and coordinate their activities[1–3]. As a consequence, numerous studies have examined the factors and processes that relate positively to the various criteria of team effectiveness [2]. Teams' effectiveness has been associated, for instance, to composition variables [4]; task characteristics and level of interdependence among members [5, 6]; leadership style [7–9]; internal states such as cohesion (e.g., [10]), shared mental models [11], cross-understanding [12], climate [13], and the presence of knowledge integration capabilities [14].

Recently, research on teams has started to pay growing attention to the network perspective [15] focusing on the ongoing social relationships in which organizational actors and teams are embedded. The research streams that concentrate on the dynamics related, respectively, to within-team networks and to between-team social networks can put forward comprehensive insights of social networks in team contexts, and can help us appreciate how teams work within the larger organizational contexts and what outcomes they generate (e.g. [16–21]). However, while at an individual level of analysis the positive relation between centrality in a network and performance has been well acknowledged [16, 22–24], at a group level of analysis empirical evidence is still controversial. Seminal studies focusing on boundaries management support the idea that work groups interpreting external activities—such as diagnosis of clients needs, feedback seeking, and selling services—as their primary goal are rewarded with supervisory higher appraisal [25, 26]. Later, the results of Baldwin et al. [24] and Sparrowe et al. [16] have questioned the existence of a strong relationship between work groups' effectiveness and the characteristics of their internal and external communication networks. Other contributions problematize such issues suggesting that a large number of external ties could be either detrimental or favorable to group performance based on several factors like, for instance, autonomy and task overload [27].

The purpose of this study is to extend this stream of research in two ways. On one hand, we offer new insights on the literature on group effectiveness by bringing additional evidence on the relationship between groups' communication network structures and groups' effectiveness. On the other hand, we contribute to the network literature by supporting the importance to focus not only on the intensity and flow of relationships within a communication network (collected via self-reported data), but also on the relationship actual content as gathered through participant observations within groups.

This chapter is divided into several sections. In the first part we offer an overview of the theoretical background on group effectiveness and social networks, underlying research questions that need further exploration. We analyzed three groups working in a major Italian clothing company. We collected data on the enacted network structure through participant observations, and we collected performance information through structured interviews. Then we discuss the evidence from the field. Conclusions, limitations of the study, and a future research agenda constitute the last section of this chapter.

## 2 Theoretical Background on Team Effectiveness and Social Networks

Because of the widespread use of teams in organizations, scholars and practitioners have devoted considerable attention to exploring the predictors of team effectiveness in terms of both design factors, e.g., size, composition, diversity, and emerging social processes, e.g., conflict, trust, identification (for an extensive review see [2]). Hackman [28], in his seminal contribution dating back to 1987 and subsequent work [29], provides a definition that has become widely accepted. He defines effectiveness as being partially about performance (teams must produce outputs considered as adequate by those who receive, or who are in charge of evaluating, them), but also about the ability of group members to work together in successive tasks, and the satisfaction that group members derive from the execution of their tasks. Relatedly, Mathieu et al. [2], when explaining the Input-Mediator-Outcome (IMO) team effectiveness framework, advocate for the relevance of members' affect and viability in addition to performance measures based on team outcomes and roles only.

Current theories highlight the importance of informal social interactions for exchanging information and knowledge, and enhancing collaboration [30]. Consequently, group relations with external parties, as well as the patterns of relations (both formal and informal) among group members, have been related to work teams' performance lately [16–20, 25, 26, 31–33]. Understanding the social network in a team context, i.e., the social relations at a group level of analysis, is important because teams are inclined to enact these types of relationships within and outside their boundaries [24].

Baldwin et al. [24] analyzed the impact of centrality in friendship and communication networks of MBA team members upon the performance of the team, but found no support for the hypothesis that individual centrality indexes were positively related to team level performance. Likewise, communication between different teams was not significantly related to team performance, while within-team communication was. Sparrowe et al. [16] extended these previous studies by delving into both the relationship between individual network structure and individual performance, and the relationship between group performance and two structural characteristics of the informal advice network (namely, group density, and level of centralization). They hypothesize a positive relation between group density and performance because numerous mutual interactions increase interdependence among members, which, in turn, enhances cooperation and the subsequent performance. On the contrary, the authors posit that group centralization produces lower levels of group performance because the scarce involvement of all group members in the advice network reduces those interdependences and cooperation that are vital for the completion of the work. Their results support the hypothesis that individual centrality in a group network is positively related to individual performance, whereas group density and centralization are not significantly related to group performance as evaluated by supervisors. Conversely, Janhonen and Johanson [33]

account for a positive relationship between team communication network density and performance. Such evidence is consistent with the meta-analysis of studies investigating the relationship between team performance and within-team network structure performed by Balkundi and Harrison [20], who found that team viability and task performance increase in teams characterized by more dense interpersonal ties. Also Reagans and Zuckerman [17] testify to the positive consequences of frequent communication among members of corporate R&D teams (that is to say, high communication network density) for their performance. In addition, the authors also found that network heterogeneity, expressed as the extent to which group members spend a significant proportion of time interacting with team members having diverse organizational tenure, relates positively to team performance. These latter interactions supposedly bring knowledge from outside members into teams, thus boosting teams' productivity. Mehra et al. [34], when investigating the relationship between friendship network's structural characteristics and groups' performance in 88 sales groups, found mixed results, however: friendship network density was positively related to one dimension of performance, i.e., customer loyalty, but not to sales amount.

Finally, in a recent contribution, Grund [35] confirms previous findings about the positive effect of within-team density and the negative effect of centralization on team performance through an analysis of longitudinal panel-data of 23 soccer teams, thus tackling the issue of causality between team network structure and performance.

Other research has devoted attention to the study of the type and amount of activities that work groups initiate with their environment to deal with external demands. Major contributions to this subject can be originally traced back to the empirical studies by Ancona [25] and Ancona and Caldwell [26] on the so-called 'external perspective'. The basic assumption of this perspective is that work groups do not function as close systems, but they influence, and are influenced by, their environment. Consequently, different groups' outcomes and internal processes stem from different approaches in handling external demands. Through a qualitative study conducted on five cross-functional groups, Ancona [25] explores the extent to which different interaction strategies, activated by the groups toward their clients, explain the variance in the performance evaluation expressed by group supervisors. Evidence collected during the first 5 months of life of these groups shows that low performing teams were the ones that set internal communications and a positive climate as their first priority, while limiting their relations with external actors. Conversely, the best performing groups engaged in two-way communications with the external environment and showed continuous efforts to diagnose clients' needs, seek feedback, and increase selling services. In addition, these latter groups were led by directive leaders who did not consider internal dynamics as the groups' first priority. Ancona and Caldwell [26] enriched the external perspective by claiming that it is not only the intensity of the flow, but mainly the content of the activities played out by groups toward their environment that makes a difference in terms of group performance. The groups examined, while somewhat similar in terms of the frequency of their interactions with the environment, performed

very differently due to the different types of boundary management activities they engaged in. In particular, the authors found that groups activating a large amount of 'ambassador activities' (aimed at protecting the group from outside pressure, persuading external actors to support the team, and lobbying for resources) or 'task coordinator activities' (aimed at coordinating specific technical tasks and seeking feedback on their development) gained better performance evaluations than groups involved in a large amount of 'scouting activities' (aimed at obtaining information and ideas about the competitors, the market and the technology) or groups that were mainly isolated. They studied 45 new product development teams: once again they were temporary groups, in charge of carrying out new and highly uncertain tasks. Wong [32] has lately corroborated the assumption that external ties are conduits of heterogeneous and novel knowledge by positing that a wide range of external advice network increases within-group task variety, thereby enhancing group effectiveness. Research on top management teams has been particularly interesting in tapping into the relevance of external ties for team and firm performance (e.g., [36]). Studies on this kind of teams have advocated for the positive effect that top managers' relationships with members of other organizations within and outside the firm's industry can exert on top management ability to foresee and interpret environmental changes and elaborate successful strategies [37, 38].

Recently, some scholars have advocated the need to investigate team internal and external social networks as not independent from each other, but to understand how they together can predict teams' performance. Shan et al. [39] examine the friendship network: they advance the interesting idea that, in order to positively influence teams performance, teams' internal and external networks should 'match' each other. More in detail, teams with strong internal friendship networks benefit from strong external networks because the internal ties enable team members to reflect and incorporate what they have learned from external parties. Conversely, teams characterized by weak internal networks of friendship would not be able to offset the costs and efforts that accessing external parties implies. A recent contribution by Chung and Jackson [40] links the effect of internal and external ties on team performance to task routines. Since performing non-routine tasks may require team members to process complex information, teams may benefit from work relationships that cut across the team boundaries. They argue that teams performing routine tasks can maximize their team performance by reducing internal work networking and external information networking as much as possible. On the contrary, teams performing non-routine tasks can maximize their team performance by increasing internal work and trust networking relationships up to a moderate level, following an inverted U-shaped relationship, and enhancing external informational networking as much as possible.

We aim at extending this stream of research by examining the impact of external network ties upon group effectiveness. As opposed to previous research, the groups that we analyze are intra-functional and stable over time, both in terms of team membership and life span. More specifically, we intend to explore if, in the specific setting of work groups that are part of a manufacturing process, but largely independent from other organizational units for resources allocation, centrality in

the organizational social networks acts as a meaningful variable in predicting group performance evaluation. We do so by analyzing not only the impact of the quantity of relations enacted by groups, but also their content and quality. To map the group networks in terms of extant relationships and their contents, we collected data mainly through a field study based on long-term participant observations within three work groups. This choice allowed us to catch the social networks actually enacted by the groups, whereas the studies cited above grasped the social networks through group members' self-reported data.

# 3 Methods

## *3.1 The Research Site*

We collected data both through qualitative techniques (observations) and quantitative techniques (structured interviews) within three groups operating in a major Italian clothing company located in central Italy.

The phases to develop a fashion collection are: prototyping (when the ideas of fashion designers turn into prototypes), sales campaign, production, and delivery of the clothes to the market. The whole cycle, which lasts approximately 6 months, is marked by the core deadline of the week-long fashion weeks held in Milan for the presentation of the new collection (one in the autumn/winter season and one in the spring/summer season). Being the fashion weeks' dates strictly given, prototyping activities are hectic and oriented towards meeting those deadlines.

The groups observed, technically called 'Collection development groups', act as gatekeepers between the fashion firm and the fashion designers (usually external to the firm). Fashion designers, who are only in charge of the creative aspects of the collection, do not participate in sales and production phases. Collection development groups are pivotal in fashion firms because they play a key role in the industrialization of fashion collections. They receive the sketches from the fashion designers, need to understand and interpret the 'imprint' that fashion designers want to confer to the specific fashion collections, and search for all the materials (fabrics and accessories) necessary to carry out the different patterns. At the same time, they 'pass' the sketches on to the pattern-making groups in charge of creating the fabric prototype, thus providing technical and style support for these other groups. They also supervise the activities necessary to complete the prototyping phase, and schedule the official dates for prototype fitting together with the fashion designer and the pattern making groups' supervisors.

The three groups that we have studied work for three different fashion designers respectively and, in order to ensure confidentiality to our informers, we will name the groups as J, M and A. The three groups show the same formal structure and are

composed by a group supervisor and three group members.[1] Stable, well-defined, and full-time membership characterizes these groups, even though their products change from collection to collection. Major uncertainties are due to the fashion designers' continuous requests for change, and to the suppliers' ability to respect delivery time, which jointly make it complicated to respect the fashion week schedule and render the use of informal collaboration, above and beyond established roles and procedures, essential.

The 12 actors are all female, the average age is 31.4 years (S.D. = 5.6), the average tenure in the company is 5.8 years (S.D. = 3.6), while the average number of years spent in the collection development groups is 3.8 years (S.D. = 3.2). As for educational attainment, 11 group members hold a high school diploma and one has a bachelor degree in Arts. Members of each group share the same office that is laid out as an open space.

### *3.2 Data Collection*

During the first phase of the research, we conducted observations within the three collection development groups for the period of time available for the creation of a whole fashion collection.[2] The groups' working hours were 8.30 a.m. to 12.30 p.m., and 2.30 p.m. to 6.30 p.m., from Monday to Friday. We planned observations to ensure appropriate time sampling: we spread them evenly over the 8 daily working hours and the 5 weekly working days. We each spent, on average, 5 h per day making observations, 3 days per week. The total number of observation hours amounts to 200 for J, 210 for M and 190 for A. During the observations, we took notes on the activities performed within the group, as well as on the interactions taking place among group members, and between group members and actors external to the group or to the organization, while respecting the actors' original language. Sometimes, we took coffee breaks or a quick lunch with our informants. Additionally, we were invited to take part in company meetings. At the end of each day we transcribed field notes into files.

Field notes represented the basis for coding, i.e., for tracing back different phenomena to main categories. According to the guidelines suggested by Strauss and Corbin [41], we constantly reviewed the field notes and let new ideas emerge from them, following a process of continuous intertwining between data collection and data analysis, in an attempt to discover recurrent classes of phenomena in the data [42, p. 126].

---

[1] Occasionally, three trainees worked in the three groups throughout the observation time length.

[2] Group members were made aware of our identity as researchers interested in the study of the dynamics of work groups. From the beginning, we informed them that we would take notes on what was going on within the group. To reduce intrusion we worked with small note pads. At the end of the study, we briefed our informants about the main findings of our research.

We began the analysis of the field data with a general framework in mind: to disclose the relational profiles of the three groups to understand if differences in the groups' communication networks led to differences in their effectiveness. Thus, the interactions taking place within the groups and between group members and actors external to the groups became our core category. Accordingly, we detailed properties and dimensions of interactions as follows: date, observer, active actor (who triggered the interaction), passive actor (the recipient of the interaction), communication means (e.g. face to face, telephone, or email), type of interdependence, and drivers. According to the type of interdependence, we classified interactions as sequential (specifying an input–output sequence of activities) or reciprocal (where one actor's outputs become another actor's inputs, and vice versa) interdependencies. As for the drivers, an initial briefing of the field notes highlighted that, while interactions appeared to be predominantly task-related, nonetheless social and emotional interactions were not marginal. We first coded every interaction as task-related (instrumental to the achievement of the group outcome, which is, in this case, the completion of all the prototypes) or social (instrumental to the life of the group, but not directly connected to the final outcome). We further identified the following drivers for each interaction:

– Information request
– Orientation request
– Advice request
– Information communication
– Orientation communication
– Advise communication
– Reporting problems
– Reporting solution to a problem
– Material requested
– Material provided
– Work assignment
– Taking charge of responsibilities
– Showing satisfaction/agreement
– Showing dissatisfaction/disagreement

As for the driver, it is worth underlining that many dimensions emerging from our coding are in common with coding systems already known in the literature. For instance, the first six dimensions represent the categories that Bales [43, 44] defines as task-oriented. The last two dimensions relate to interactions that affect the socio-emotional sphere. Unlike Bales' view, the evidence from the field made us believe that the same drivers of interactions apply both to interactions aimed at task completion and to interactions bounded to the socio-emotional area.

To guarantee homogeneity of coding criteria, each researcher, after independently coding her own field notes, systematically coded a randomly chosen 30 % of field notes recorded by the other researcher and compared the coding criteria at weekly meetings. We reconciled disagreements through discussion.

The coding applied to interactions enabled us to obtain a set of actor-by-actor adjacency matrices, in which the cell $a_{ij}$ reports the number of interactions activated by the actor i that involve the actor j, in relation to different properties of interactions. We applied social network analysis techniques to matrices [45, 46]. For each matrix, we calculated the actors' centrality in terms of their outdegree and indegree [46]. Outdegree represents the number of times an actor initiated an interaction, while indegree measures the number of times an actor was drawn into an interaction by others. Degrees allowed us to determine which actors were central in the group and which were peripheral [46–48]. Coding and analyzing interactions allowed us to derive the structure of the communication networks enacted by the three collection development groups. Accordingly, the system of roles and relations among roles emerged as the recurrent schemes of interaction processes between actors [49].

In a more specific attempt to analyze the relationship between group effectiveness and social networks, we integrated qualitative techniques with a quantitative technique such as structured interviews administered at the end of the observation period. While observations allowed us to grasp the enacted communication networks, the interviews provided us with information about effectiveness measures.

At the end of the observation period we conducted structured interviews with 57 actors including the collection development groups members, top management, and first and second-level managers belonging to all the organizational units. Interviews lasted between 40 and 100 min according to the interviewees' degree of involvement. In the first part of the interviews we collected demographic data. In the second section, which we describe in detail in the next paragraphs, we grasped the group effectiveness evaluations.

### *3.3 Work Group Effectiveness*

Regarding the appraisal of groups effectiveness, it is worth noting that the firm under study does not have a formal system of performance appraisal in place, neither for individuals, nor for groups or organizational units. Therefore we availed ourselves of the interviews to collect three measures of group effectiveness:

*Group members' evaluation of effectiveness*. Members of the three groups rated the effectiveness of their own group along seven items including[3]: quality of work done, completing work on time, timeliness on problem solving, ability to provide innovative products, coping with uncertainty, fashion designer' satisfaction, overall performance. We employed a seven-point scale ranging from 'very poor' (1) to 'outstanding' (7).

[3]Five items were drawn from Campion et al. [50] and Sparrowe et al. [16], while the remaining two were specifically developed for this study.

*Senior managers' and peers' evaluation of effectiveness*. Consistent with the idea that effective groups produce outputs considered as adequate by those who receive or who are in charge of evaluating them, top management and all the middle managers and supervisors in different functional departments rated the collection development groups effectiveness on ten items, including the above seven items and three additional items relevant to the management view of group effectiveness: quality of the relations among group members, cooperation with other departments, and taking charge (ability to generate new ideas). The same seven-point scale was used.

*Group members' satisfaction*. The questionnaire included 13 items on different topics such as satisfaction with work, colleagues and supervisors, satisfaction with wage, opportunity for growth, autonomy, trust in management. Again we used a seven-point scale ranging from 'very dissatisfied' (1), 'neither satisfied nor dissatisfied' (4), 'very satisfied' (7).

### *3.4 Group Composition Variables*

The tasks carried out by the collection development groups do not require a specific background. For this reason, we assumed that group tenure would act as a good proxy for the ability to successfully carry out the work. Moreover, we used, as an additional measure of group members' ability to succeed in their work, the evaluations that each group member gave to herself and to group mates in relation to six core competences: autonomy, flexibility, ability to cope with stress, relational capability, negotiation ability, and product knowledge. We derived the above competencies from pilot interviews conducted with four fashion experts employed in four competing fashion companies. Experts indicated ten competencies that they believed represented core competencies for people working in collection development offices: we chose the six ones that were quoted by all the four experts.

## 4 Evidence from the Field

In Table 1, we provide descriptive statistics of the effectiveness evaluations that the three collection development groups received by senior managers and peers. Differences in the average evaluation assigned to the three groups emerged from the survey and, specifically, the evaluations of group J are notably higher than those of groups A and M.

Differences in evaluations are not attributable to differences in group members' abilities that would make them more or less effective in performing their job. In fact, group J's members, with the only exception of the group leader, received the lowest rates in individual competencies as shown in Table 2.

**Table 1** Effectiveness evaluations of the three groups by top managers and peers

| | Group J | Group M | Group A |
|---|---|---|---|
| Mean | 5.3 | 4.7 | 4.6 |
| Standard deviation | 0.8 | 1.1 | 0.9 |

**Table 2** Competences of members of the collection development groups

| | 1 | 2 | 3 | 4 | 5 | 6 | Mean | Std dev |
|---|---|---|---|---|---|---|---|---|
| Group J | | | | | | | 4.9 | 0.5 |
| JL | 6.3 | 6.3 | 6.7 | 6 | 7 | 6.7 | 6.5 | 0.4 |
| J1 | 5.7 | 5.7 | 5.7 | 4 | 4.7 | 5.7 | 5.2 | 0.7 |
| J2 | 4 | 4 | 3.7 | 3 | 3.7 | 4 | 3.7 | 0.4 |
| J3 | 4 | 4.7 | 4.7 | 3.3 | 3.7 | 4.3 | 4.1 | 0.5 |
| Group M | | | | | | | 5.3 | 0.7 |
| ML | 4 | 6 | 5.5 | 5.5 | 6 | 5.3 | 5.4 | 0.7 |
| M1 | 5.5 | 6.3 | 6 | 4.5 | 6 | 5.5 | 5.6 | 0.6 |
| M2 | 5.5 | 5.5 | 5.5 | 3 | 5 | 4.2 | 4.8 | 1.0 |
| M3 | 5.5 | 4.5 | 5.8 | 6.3 | 5.3 | 5.3 | 5.4 | 0.6 |
| Group A | | | | | | | 5.0 | 0.7 |
| AL | 4.5 | 5 | 6.5 | 6 | 6.5 | 5.5 | 5.7 | 0.8 |
| A1 | 4.8 | 5 | 4.5 | 4.8 | 5 | 5.3 | 4.9 | 0.3 |
| A2 | 4.8 | 5.8 | 6 | 4.5 | 4.8 | 6 | 5.3 | 0.7 |
| A3 | 3.5 | 4 | 4.8 | 2.8 | 4.5 | 5.3 | 4.1 | 0.9 |

Our subsequent analysis aimed to understand if networks variables were better predictors of differences in the evaluations of groups' effectiveness given by peers and senior managers. We derived the three groups' relational profiles from the large amount of interactions recorded during our presence in the field. Out of 9.172 interactions recorded, 23.11 % (equal to 2.119) involved the top performer group J, 45.42 % (equal to 4.165) comprised M's group members, and 31.47 % (corresponding to 2.886) involved group A. The analysis of the communication networks enacted within groups highlights that groups J and M, respectively the best and the worst performer, show similar patterns of interactions in terms of density and centralization, while group A displays a pretty different internal network structure. Table 3 reports degree centrality measures for task-oriented interactions and social interactions in the three groups.

Concerning task-related interactions, groups J and M are highly centralized in terms of their outdegree: leaders, as compared to team members, are the most active actors in initiating task-related interactions. Indegree values, conversely, suggest that all members of the teams are drawn into a comparable number of task-related interactions. In both groups, group leaders are the most central actors. They supervise the work performed by their coworkers, who do not have the freedom to take major decisions on the materials to buy or on the interpretation of the fashion designers' sketches. We refer to this pattern of task communication as 'manager-centered'. Group A shows different patterns of task-related interactions among group members because of the leader's peculiar role, whose priority is to deal with

**Table 3** Degree centrality in within groups task-related interactions and socially-related interactions for J, M and A

| | Task-related interactions | | Socially-related interactions | |
|---|---|---|---|---|
| Groups' members | Outdegree | Indegree | Outdegree | Indegree |
| J leader | 352 | 185 | 40 | 29 |
| J member 1 | 120 | 189 | 22 | 36 |
| J member 2 | 52 | 99 | 24 | 18 |
| J member 3 | 96 | 136 | 39 | 24 |
| J (whole group) | 0 | 13 | 0 | 18 |
| M leader | 549 | 315 | 101 | 25 |
| M member 1 | 229 | 238 | 78 | 57 |
| M member 2 | 290 | 296 | 108 | 42 |
| M member 3 | 210 | 269 | 45 | 53 |
| M (whole group) | 0 | 147 | 0 | 171 |
| A leader | 72 | 85 | 17 | 2 |
| A member 1 | 123 | 102 | 58 | 38 |
| A member 2 | 127 | 158 | 78 | 54 |
| A member 3 | 143 | 92 | 62 | 46 |
| A (whole group) | 0 | 30 | 0 | 75 |

the fashion designer: in this case, group members are given more responsibility to make decisions about the features of the collection without the leader's continuous intervention. Consequently, group A's interactions are almost homogeneously distributed among group members and the leader loses her centrality in task-related interactions. Such pattern of task communication can be labeled as 'group member-centered'.

On the contrary, an analysis of interactions classified as social shows a similar pattern for the three groups. None of the actors in the three groups seems to play a major role in the interaction flow. However, generally speaking, group J activated less social interactions (16 %) than the other two groups (respectively 21 % for M and 31 % for A). These results are consistent with Ancona's [25] external perspective: group J, which receives the highest performance rate by evaluators, is less concerned with engaging in interactions instrumental to the social life of the group, but is strongly focused on interactions instrumental to the achievement of the group goals. In addition, high levels of task interaction centralization do not seem to hamper cooperation and coordination within the group and across the group boundaries.

Interesting and counterintuitive insights derive from the analysis of the role that external communications between the three groups on one hand, and organizational actors belonging to different units on the other, play in influencing the performance evaluations that these latter give to the three groups.

In terms of the social structure that group members enacted with other organizational actors, we recorded a consistent amount of interactions taking place between the three groups and the organizational units that operate downstream the collection development process. In particular, in group A, 76 % of interactions

involve outsiders, and this percentage decreases to 65 % for J and to about 58 % for M. This implies that in terms of the sole amount of external communication, the best performer group J, with approximately 1,400 interactions, seems less connected with external parties than group M (approximately 2,400 interactions) and group A (2,200 interactions). Keeping in mind that extant research supports the importance of external network ties, these results call for further elucidation.

To explain these contrasting network effects, we went back to the content of field notes to explore more deeply the role that the enacted communication network structure had on its members. Our field evidence suggests that the higher evaluations received by group J can be traced back to modalities of collaborative design not formally required and spontaneously undertaken by the group. The group does not see itself as part of a sequential process, but it promotes co-design activities, thus involving different competences from the very beginning of the collection development on. Three elements support this explanation.

In the first place, looking at the temporal distribution of interactions, it emerges that group J actively involves downstream departments since the very beginning of the project, in phases where the intervention of these departments is not formally designed by management. Figure 1 reports the distribution of the interactions activated by the three groups with downstream departments, regarding respectively communication of information/advice and orientation, request for information/advice and orientation, and signaling of a problem (we measured such distributions by splitting the whole cycle of collection development into four different phases).

J's interactions activities do not vary across the phases that compose the fashion collection. Mary, J's group leader, acknowledged during the interview how much she perceives her role as a coordinating one, even if it is not formally prescribed. In her own words:

> I realize that my work has a tremendous impact on the whole collection development process. I take decisions that will influence the whole profitability of the collection. You know, I am not sure that even top managers, like Joseph or Faust, fully grasp this aspect. We, as leaders of the collection development department, have to take decisions that are bigger than us, which have an impact that is not recognized by formal design, which doesn't favor horizontal integration. Honestly, the organizational reward system does not recognize it, either.

On the contrary, groups M and A concentrate the larger amount of interactions in the last two product development stages, when problems have already arisen and touched on downstream departments. At that point of time, the need for coordination emerges as the only way out to solve difficult situations. The following excerpt from a field note shows how the Purchasing head complains about M group leader's inability to anticipate problems and pave the way for their solution:

> The manager of the Purchasing department, Robert, starts talking with Melissa, M's group leader: 'Ok, how are you doing? Are the others aware of this situation?'
>
> Melissa: 'Well, I talked to Joseph, the COO. This morning I also briefed the Sales director'.

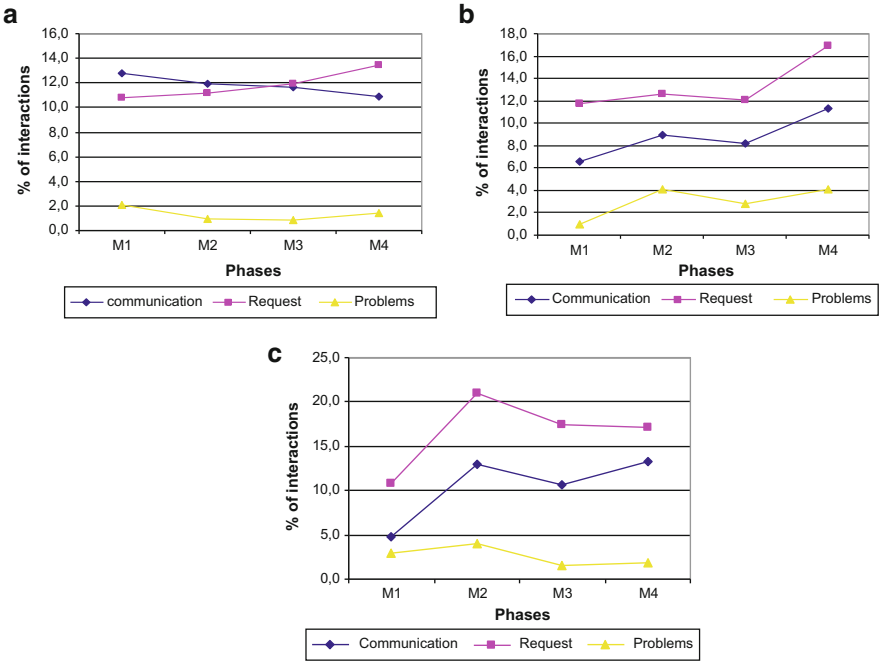


**Fig. 1** (**a**) Trend of interactions over time between group J and actors external to the group for different categories of interactions. (**b**) Trend of interactions over time between group M and actors external to the group for different categories of interactions. (**c**) Trend of interactions over time between group A and actors external to the group for different categories of interactions

> Robert: 'The delay with which you ordered the fabrics is crazy. It has never happened that, at the beginning of January, we still have to launch the orders for the first collection. This is a huge problem'.
>
> Melissa: 'It is not my fault, you know that the problem is in Milan [where the designer's headquarter is located], sometimes they do not know what they want and they cause a delay'.
>
> Robert: 'Well, anyway, you should have told us about this delay; we could have managed to do something to anticipate a shortage of fabric. Problems cannot come to the surface only at the very last moment!'

Second, concerning the actual content of interactions, the analysis brings up that group J shows the lowest number of requests for information/advice/orientation, but it prompts numerous communications of information, advice, and orientation. Only few interactions have to do with signaling the presence of a problem in this group. In the majority of cases, while communicating information, J's leader communicates also the solution of a problem or elicits joint problem-solving mechanisms that enable actors to coordinate work and solve problems upon their rise. Other organizational actors do not perceive the interactions triggered by this group as an annoyance, but as a way to collaborate in the development of the best fashion collection possible. Joint problem solving allows organizational actors to

work through problems while they are on the fly. As a consequence, downstream organizational actors do not have to engage in autonomous 'patching problem-solving' when issues have gone too far down the collection development process. The following excerpt from a field note tells us about a phone call from Mary to the chief of the Production department, Will, in which they jointly make decisions about flower decorations to put on an evening dress:

> Will, I have just received the flowers [that you made]. How would you like the pistils to be? Light blue, [i.e.,] same color as the fabric? Wait a minute [She takes the designer's sketches] The fabric is really, really pale blue and I think that she [the designer] meant flowers to be contrasting. Why don't we try for skin-colored, leather flowers? I think that it would be a nice fit: a striking match, but not too provocative. [She listens to Will for a minute or so] I see, I see, leather flowers, but in a matching blue. I can have a sample easily made by Alexandra [one of her group's members] by the end of today, and we can take a final step together early tomorrow morning.

Conversely, interactions touching on the other two groups A and M are perceived as a disturbance since they do not foster any cooperation (due to the time frame when they are enacted as well as to their actual content). M's members raise a large number of problems in search for a solution to outsiders, mostly in the last and more chaotic stages of the collection development process.

Eventually, J is the only group activating a significant amount of reciprocal interactions, and not just sequential ones, with other organizational units. Interactions classified as reciprocal between the groups and other organizational units amount up to 27.11 % of the total for J, 15.46 % for M and 11.95 % for A. These interactions do not imply a one-way communication, but entail the generation of a continuous sharing of information and a steady intention to jointly solve problems that might arise, thus promoting learning and innovation.

The unavailability of enacted network data would have prevented us from accounting for the role that the social networks in which groups are embedded play in shaping their effectiveness evaluations. It was mainly the actual content of the social networks that we observed that helped us explain the network effects. Our groups were similar in terms of frequency of the interactions that they played out with their environment. The difference lied in the actual content of these interactions and in their consequences on group performance. In addition to the evaluations that we specifically asked of our informants, the excerpts from the field notes below exemplify the different evaluations that organizational members provide for the three groups. In the first one, the general director congratulates group J's leader, Mary, on her group's ability to make excellent garments.

> Mary [group J's leader] goes back to look at the outfits that are on the racks and there she meets Max [general director]. They comment on each and every outfit:
>
> Max: 'Are these the army dresses that were top secret up to a couple of days ago?'
>
> Mary: 'Yes, they are.'
>
> Max: 'You rendered the gist of army clothes beautifully. I'm impressed. Everybody here would have bet that it couldn't have been done. They looked almost impossible to make. You and your group did succeed in a mission impossible-like task.'

In the second one, Joseph, the COO, complains about group A's recurrent problems with meeting deadlines and underlines that the leader does not take into account the relevance of cooperation across units:

> The COO tells Stefanie [group A's leader] with an angry voice: 'Listen, Allison [the internal designer] has told me once again that you are late with the collection delivery. That drives us all crazy. I wonder why it has always to be like that, every single collection we have to push you to work faster and to work more accurately. You aren't alone in this company: you should try much harder to solve problems with coworkers [working in different units], but you tend to stick to your office and that's it. You treat us just as firefighters.'

Eventually, the third excerpt shows how the chief of pattern makers, Florence, is dissatisfied with an output of Melissa's M group and blames her for not making earlier contacts with significant coworkers:

> Melissa: 'Unfortunately, Florence, we were obliged to put silvery brown velvet in place of light brown because we don't have that color in our storage.'
>
> Florence: 'But it makes me sick.'
>
> Melissa: 'What could I've done? That was the only fabric that we had.'
>
> Florence: 'How come, Melissa? You knew pretty well that Francine [the chief fashion designer] wanted that color badly, and you knew it ahead of time, how can you possibly not have made an order to our supplier? And then, if the right fabric was not in place, why didn't you call me when you made this jacket and ask me what my opinion about light brown was. We'd have a much better frock now if only you had given me a simple call a month ago.'

An analysis of team members' perceptions of their group's effectiveness suggests the presence of a strong alignment between inside and outside evaluations as far as the performance dimension is concerned. Group J is considered the best performer also by its internal members (mean = 5.57; S.D. 0.52), followed respectively by group A (mean = 4.86; S.D. = 0.26) and group M (mean = 4.81; S.D. 0.78). Even though the company does not run a formal performance appraisal, the constant interactions between the groups and other organizational actors can represent a vehicle for conveying appraisals and communication of satisfaction with the group throughout the company, thus favoring the above described alignment.

Conversely, concerning the group members' satisfaction with the group life, evidence shows a slightly different picture. Members of group A, that we defined as 'group member-centered', are the most satisfied (mean = 4.61, S.D. = 0.96), especially in relation to the items referred to autonomy and quality of the relationship with colleagues and supervisor. On the other hand, members of group J and group M—that we labeled as 'manager-centered'—are satisfied, but to a lesser extent (respectively J mean = 4.36, S.D. = 0.77; M mean = 4.32, S.D. = 0.69).

## 5 Discussion and Conclusive Remarks

As organizational achievements depend more and more on the work of groups, the comprehension of the way they function and how to improve their performance is becoming increasingly important. Our study points to the importance, while

studying social networks and their effects on group performance, to consider tie content, that is to say the quality and nature of the relationship, thus going beyond the perception of the existence or lack of a particular relationship and/or its strength. Kilduff and Brass [51] have underlined lately that the research program on networks would profit from investigating more deeply the impact that different types of relations have on group functioning. Our findings suggest that it would be useful to develop a thoughtful comprehension of teams' dynamics and of their relationships within the larger organizational context. Through an ethnography conducted within three groups engaged in the development of innovative products, we show how qualitative information on the nature and dynamics of the ties between group members and other organizational actors can enhance our comprehension of the impact of network relationships on organizational behaviors.

As a consequence, we claim that the prolonged observation of group members' interactions offers researchers a privileged, thorough perspective into a group's social network. A communication network, in fact, embraces all the different ties through which organizational actors share information and advice, search and provide guidance and help, to attain organizational goals [16]. Yet, a communication network can be 'split' according to the different properties of interactions to gain multiple views and account for different courses of organizational action. As we have highlighted, a high centrality degree in the request for information/advice network as opposed to the reporting of a problem or the communication of information/advice network can generate different effects on members' behaviors and on the evaluation of groups' effectiveness. Collapsing all these dimensions of the communication network into a unique number, such as the one typically used in self-reported network data, might limit the researchers' comprehension of how network relationships really work and evolve in organizations. We believe this to be the main theoretical contribution of our study.

Our research also expands on the role of team leaders. Previous research by Balkundi et al. [9] has claimed that a formal leader's high centrality (as a proxy for prestige) in the intrateam advice network generates lower team conflict and higher team viability, whereas opposite effects are posited when the leader acts as a broker between otherwise unconnected team members. Other studies underline the positive relationship between team leaders' ties with external parties in the organizational network and team overall performance [33], team creative performance especially [52]. In particular, the latter authors suggest that leaders' gatekeeping role should be coupled with a limited involvement in the intrateam communication and problem solving network. Our findings enrich this view by stressing the positive outcomes that team leaders who have also a high external prestige, in addition to internal prestige, can bring to their groups. Contrary to Kratzer and colleagues' predictions, our data suggest the need for a 'fit' between leaders' external and internal work-related networks. Group J leader couples her external network centrality with a similar centrality in the internal network, thus suggesting that this group would be more equipped from a relational point of view to bring in and incorporate within its daily activities external inputs and insights. Conversely, group A leader acts mainly as a gatekeeper, but her peripheral role in intrateam work-related network

does not allow the group to exploit the same opportunities. Group M leader's enactment of external interactions, which concentrated mainly in the second half of the collection development process, makes it hard to actively exploit external advice and information. Our evidence seems therefore to apply the argument of contingency between internal and external network ties prompted by Shan et al. [39] also to team leaders' behaviors.

In addition, our evidence brings to the fore that the experience of working with organizational actors who do not belong to the group represents an asset for the leader of the highest performing group that is not shared by other team members (who do not have equal access to external networks). An unequal spread of experience within a group adds up to the group performance: this finding is in line with Gardner et al.'s [14] argument that, when the tasks required of team members are uncertain, an uneven distribution of experiential resources increases knowledge integration capability since team members can easily detect, and make reliance on, those individuals who have more experience and competencies. Bringing these reflections together, we maintain that a team leader who is capable and willing to set and handle ties outside the team boundaries, as well as within the group, enhances the team effectiveness.

Our findings and future research should be considered in light of the study's strengths and limitations. One of its major strengths is that the research was conducted in the field on real groups working on a production task. The long time spent in the field allowed us to understand how the groups' specific tasks and networks of relationships impacted on group effectiveness. As underlined by Hansen [53] first, and by Cummings and Cross [18] later, one of the challenges in developing a deep comprehension of the relationship between groups' social structure and performance lies in the ability of researchers to come to grips with the characteristics of the work itself. Our field study has two methodological contributions to do, then. First, we integrate qualitative and quantitative techniques both in data gathering and in data analysis, while the majority of qualitative and quantitative studies are based upon respectively qualitative or quantitative techniques only. By combining qualitative, typically field note excerpts and their coding, and quantitative, mostly social network analysis techniques, we achieve a more thorough and rich comprehension of the social setting under examination. Second, unlike the vast majority of studies on social networks (e.g., [16]), observing phenomena at the time and in the place where they occur allows us to grasp the actual interactions among group members and between group members and other organizational actors, and not only those intentionally declared during structured interviews.

However, the exploratory analysis of a single case does not allow us to make general statements; accordingly, our evidence cannot be generalized to other settings. We believe that the model that we built has theoretical significance [54], but more work is needed to understand if the relations that we observed can be applied to other organizations or whether they need further refinements. Moreover, in order to assess the viability of the processes that we observed, it would be worth observing again the same groups in the development of another collection. Replication of

the study in groups performing different tasks and operating in markets placing different demands on them might also help define better the interplay between social networks and group performance.

From a managerial viewpoint, the evidence of a design for manufacturing approach spontaneously activated by a group operating in a fashion industry raises important issues concerning that specific industry and has immediate practical implications for firms whose upstream activities substantially impact the ones downstream. In these cases, usually the effectiveness of first steps, which account for the product design phase, can be improved not only by developing specific design competencies, but also by linking competencies that are distributed downstream along the production chain and, sometimes, through the involvement of suppliers and final clients in the whole process as well.

According to the above description of a fashion collection development process, it clearly appears that the tasks performed by the groups under study have the biggest impact on the whole process in terms of product quality, schedule, and budget performance. Nonetheless, only rarely do fashion firms apply design for manufacturing modalities to their manufacturing processes. The fashion industry culture in fact fosters the assumption that organizational units like engineering, production, and quality control, have to give way to the choices taken by upstream creative departments: creativity stands in the first place, no matter how this assumption may hamper the attainment of efficiency goals, and create internal tensions and conflicts [55]. The absence of constraints upon creative choices is believed to be the way to achieve high-quality products. According to this view, the collection development process seldom conveys feedbacks and recycles from downstream up to upstream departments. Under such circumstances, top management may mistakenly perceive modalities of design for manufacturing, alongside the interdependencies that it generates, as a potential threat to the very strict timetable of a fashion collection.

Nevertheless, in the context that we observed, the opportunity to map the enacted networks informed managers and group members about particular needs for communication and coordination that would have been difficult to comprehend based on self-reported networks only.

## Glossary

**Adjacency matrix** Actor-by-actor matrix in which the cell $a_{ij}$ reports the number of interactions activated by the actor i that involve the actor j, in relation to different properties of interactions.

**Communication Network** Network involving all the relationships through which organizational actors share resources such as information, help, and guide related to the execution of their work.

**Group effectiveness** Multidimensional construct that entails how: groups must produce outputs considered as adequate by those who receive, or who are in charge of evaluating; group members are able to work together in successive

tasks; group members derive satisfaction from the execution of their tasks in the group.

**Indegree** The number of times an actor is drawn into an interaction by others.

**Outdegree** The number of times an actor initiated an interaction.

**Work group** Bounded set of individuals, working interdependently towards a common goal.

**Workplace Social Networks** Ongoing social relationships in which organizational actors are embedded in the workplace.

## References

1. Zellmer-Bruhn ME (2003) Interruptive events and team knowledge acquisition. Manage Sci 49(4):514–528
2. Mathieu J, Travis Maynard M, Rapp T, Gilson L (2008) Team effectiveness 1997–2007: a review of recent advancements and a glimpse into the future. J Manage 34:410–476
3. Wageman R, Gardner H, Mortensen M (2012) The changing ecology of teams: new directions for teams research. J Organ Behav 33:301–315
4. Bell ST (2007) Deep-level composition variables as predictors of team performance: a meta-analysis. J Appl Psychol 92:595–615
5. Wageman R (1995) Interdependence and group effectiveness. Adm Sci Q 40:145–180
6. Stewart GL, Barrick MR (2000) Team structure and performance: assessing the mediating role of intrateam process and the moderating role of task type. Acad Manage J 43:135–148
7. Komaki JL, Minnich MR (2002) Crosscurrents at sea: the Ebb and flow of leadership in response to the shifting demands of racing sailboats. Group Organ Manage 27:113–140
8. Burke CS, Stagl KC, Klein C, Goodwin GF, Salas E, Halpin SM (2006) What type of leadership behaviors are functional in teams? A meta-analysis. Leadersh Q 17:288–307
9. Balkundi P, Barsness Z, Michael JH (2009) Unlocking the influence of leadership network structures on team conflict and viability. Small Group Res 40:301–322
10. Beal DJ, Cohen RR, Burke MJ, McLendon CL (2003) Cohesion and performance in groups: A metaanalytic clarification of construct relations. J Appl Psychol 88:989–1004
11. Mathieu JE, Heffner TS, Goodwin GF, Cannon-Bowers JA, Salas E (2005) Scaling the quality of teammates' mental models: equifinality and normative comparisons. J Organ Behav 26:37–56
12. Huber GP, Lewis K (2010) Cross-understanding: implications for group cognition and performance. Acad Manage Rev 35(1):6–26
13. Tesluk PE, Vance RJ, Mathieu JE (1999) Examining employee involvement in the context of participative work environments. Group Organ Manage 24:271–299
14. Gardner HK, Gino F, Staats BR (2012) Dynamically integrating knowledge in teams: transforming resources into performance. Acad Manage J 55(4):998–1022
15. Borgatti SP, Foster P (2003) The network paradigm in organizational research: a review and typology. J Manage 29:991–1013
16. Sparrowe RT, Liden RC, Wayne SJ, Kraimer ML (2001) Social network and the performance of individuals and groups. Acad Manage J 44(2):316–325
17. Reagans R, Zuckerman EW (2001) Networks, diversity, and productivity: the social capital of corporate R&D teams. Organ Sci 12(4):502–517
18. Cummings JN, Cross R (2003) Structural properties of work groups and their consequences for performance. Soc Netw 25:197–210
19. Oh H, Chung M-H, Labianca G (2004) Group social capital and group effectiveness: the role of informal socializing ties. Acad Manage J 47:860–875

20. Balkundi P, Harrison D (2006) Ties, leaders, and time in teams: strong inference about network's structure effects on team viability and performance. Acad Manage J 49(1):49–68
21. Henttonen K (2010) Exploring social network on the team level—a review of the empirical literature. J Eng Technol Manage 27:74–109
22. Brass DJ (1984) Being in the right place: a structural analysis of individual influence in an organization. Adm Sci Q 26:331–348
23. Ibarra H (1993) Network centrality, power, and innovation involvement: determinants of technical and administrative roles. Acad Manage J 36:471–501
24. Baldwin TT, Bedell MD, Johnson JL (1997) The social fabric of a team-based M. B. A program: network effects on student satisfaction and performance. Acad Manage J 40:1369–1397
25. Ancona DG (1990) Outward bound: strategies for team survival in an organization. Acad Manage J 33(2):334–365
26. Ancona DG, Caldwell DF (1992) Bridging the boundary: external activity and performance in organizational teams. Adm Sci Q 37:634–665
27. Haas MR (2002) Acting on what others know: distributed knowledge and team performance. Unpublished doctoral dissertation, Harvard University, Cambridge
28. Hackman JR (1987) The design of work teams. In: Lorsch JW (ed) Handbook of organizational behavior. Prentice-Hall, Englewood Cliffs, pp 315–342
29. Wageman R, Hackman JR, Lehman E (2005) Team diagnostic survey: development of an instrument. J Appl Behav Sci 41:373–398
30. Cross R, Parker A (2004) The hidden power of social networks. Harvard Business School Press, Boston
31. Bertolotti F, Macrì DM, Tagliaventi MR (2005) Spontaneous self-managing practices: evidence from the field. J Manage Inq 14(4):1–19
32. Wong S-S (2008) Task knowledge overlap and knowledge variety: the role of advice network structures and impact on group effectiveness. J Organ Behav 29:591–614
33. Janhonen M, Johanson J-E (2011) Role of knowledge conversion and social networks in team performance. Int J Inf Manage 31:217–225
34. Mehra A, Dixon AL, Brass DL, Robertson B (2006) The social network ties of group leaders: implication for group performance and leader reputation. Organ Sci 17(1):64–79
35. Grund TU (2012) Network structure and team performance: the case of english premier league soccer teams. Soc Netw 34(4):682–690
36. Carpenter MA, Geletkanycz MA, Sanders WG (2004) Upper echelons research revisited: antecedents, elements, and consequences of top management team composition. J Manage 30:749–78
37. Collins CJ, Clark KD (2003) Strategic human resource practices, top management team social networks, and firm performance: the role of human resource practices in creating organizational competitive advantage. Acad Manage J 46:740–751
38. Yoo JW, Reed R, Shin SJ, Lemak DJ (2009) Strategic choice and performance in late movers: influence of the top management team's external ties. J Manage Stud 46(2):308–335
39. Shan PP, Dirks KT, Chervany N (2006) The multiple pathways of high performing groups: the interaction of social networks and group processes. J Organ Behav 27:299–317
40. Chung Y, Jackson SE (2013) The external and internal networks of knowledge-intensive teams. J Manage 39(2):442–468
41. Strauss A, Corbin J (1998) Basics of qualitative research: techniques and procedures for developing grounded theory. Sage, Thousand Oaks
42. Miles MB (1983) Qualitative data as an attractive nuisance. In: Van Mannen J (ed) Qualitative methodology. Sage, Beverly Hills, pp 117–134
43. Bales RF (1950) Interaction process analysis: a method for the study of small groups. Addison-Wesley, Cambridge
44. Bales RF (1999) Social interaction systems: theory and measurement. Transaction Publishers, New Brunswick
45. Nelson RE (1988) Social network analysis as intervention tool. Group Organ Stud 13:39–58

46. Wasserman S, Faust K (1994) Social network analysis. Methods and applications. Cambridge University Press, Cambridge
47. Freeman LC (1979) Centrality in social networks: I. Conceptual clarification. Soc Netw 1:215–239
48. Borgatti SP, Everett MG, Freeman LC (2002) Ucinet for windows: software for social network analysis. Analytic Technologies, Harvard
49. Barley SR (1990) Images of imaging: notes on doing longitudinal field work. Organ Sci 3:220–247
50. Campion MA, Papper EM, Medsker GJ (1996) Relations between work team characteristics and effectiveness: a replication and extension. Personnel Psychol 49:429–452
51. Kilduff M, Brass DJ (2010) Organizational social network research: core ideas and key debates. Acad Manage Ann 4(1):317–357
52. Kratzer J, Leenders RTAJ, Van Engelen JML (2008) The social structure of leadership and creativity in engineering design teams: an empirical analysis. J Organ Behav 25:269–286
53. Hansen MT (1999) The search-transfer problem: the role of weak ties in sharing knowledge across organization subunits. Adm Sci Q 44:82–111
54. Yin RK (2003) Case study research: design and methods, 3rd edn. Sage, Thousand Oaks
55. Mills C (2011) Enterprise orientations: a framework for making sense of fashion sector start-up. Int J Entrep Behav Res 17(3):245–271