# Influence of Social Identity on Negative Perceptions in Global Virtual Teams

Pekka Vahtera[a], Peter J. Buckley[a], Murod Aliyev[a,*], Jeremy Clegg[a], Adam R. Cross[b]

[a] *Leeds University Business School, University of Leeds, Leeds LS2 9JT, United Kingdom*
[b] *International Business School Suzhou, Xi'an Jiaotong-Liverpool University, Room BB524, 111 Ren'ai Rd, Suzhou Dushu Lake Science and Education Innovation District, Suzhou Industrial Park, Suzhou, P.R. China, 215123*

## ARTICLE INFO

## ABSTRACT

The paper combines insights from social identity theory and organizational network theory to specify the conditions under which social capital can induce negative attitudes in global virtual teams. The structural configuration of social capital has crucial implications for the socio-cognitive processes causing individuals to adopt negative attitudes to out-group members. The paper evaluates both the negative implications of structural configurations on out-group perceptions, which are important precursors to successful intergroup interaction in global virtual teams. We collected data from 160 actors across 40 global virtual teams embedded within three separate organizations. 34 social identity groups were detected and ties between and within the groups were investigated. Our analyses provide insights on the roles of social identity groupings and social capital as well as in-group brokerage and interactions on (negative) perceptions of other group members in global virtual teams.

## 1. Introduction

Over the past two decades, the theory of social capital has gained increasing salience in various fields of social sciences research (for a review, see Adler and Kwon, 2002; Field, 2008; Keeley, 2007; Klitmøller and Lauring, 2013). Major advances in the development and testing of social capital have been undertaken by social network researchers (Burt, 1992, 1997; Granovetter, 1973). Central to this research stream is that ties and relationships reside at the core of analysis because embedded resources and relational benefits cannot be captured without examining underlying characteristics of the network. By contrast, early network research (Heider, 2013; Simmel and Wolff, 1950), as well as more recent studies (Kilduff and Krackhardt, 2008; Schulte et al., 2012), have adopted more individualistic and psychologically oriented approaches, including consideration of individual perceptions and cognitions in the concept of social networks. To date, these research streams have focused attention primarily on network structures and actor attributes that facilitate beneficial outcomes. Hence, negative effects arising from network participation have generally been overlooked. Although many studies recognize that networks can include unwanted effects (i.e. conflict and dislike) (Labianca and Brass, 2006; Portes and Landolt, 1996), little prior research has empirically investigated the *sources and conditions* that induce such negative effects (for exceptions, see Huitsing et al., 2012; Labianca et al., 1998).

These types of negative aspects of networks are likely to be a key challenge for any multinational corporation (MNE) as they potentially influence innovation, product development, and learning on a global scale (Kogut and Zander, 1993; Nohria and Ghoshal, 1997). Indeed, there are several fundamental differences between traditional domestic teams and MNE teams such as linguistic

---

\* Corresponding author.
  *E-mail address:* M.Aliyev@leeds.ac.uk (M. Aliyev).

differences (Peltokorpi and Vaara, 2014), time management (Saunders et al., 2004), virtual communication (Zimmermann, 2011), cultural diversity (Stahl et al., 2010), geographic dispersion (Gibson and Gibbs, 2006), and level of conflict (Hinds and Bailey, 2003), amongst other things.

Social identity theory (henceforth referred to as SIT) (Tajfel and Turner, 1979, 1985) suggests that negative perceptions are intertwined with perceptions of group membership, which is an important aspect of self-identity. Specifically, identification may promote a tendency to favour the in-group over the out-group[1] in evaluations and distribution of resources (Struch and Schwartz, 1989), which can be manifested as negative perceptions towards the out-group (Brown, 2000). Considerable attention has been paid to the psychological moderators of bias (for a review, see Hewstone et al., 2002) but little attention has been given to specific *types of ties* (i.e. trust and hindrance ties) and the *structure* of these ties in facilitating or impeding organizational outcomes. This is especially the case for MNE context, and more specifically, global virtual teams utilized by MNEs. Previous studies leave unspecified: (i) how actors' ties *within* an identity group, (ii) how the ties *outside* identity group (i.e. as a part of larger network), and (iii) how the structure of the identity group itself influences negative perceptions of others within networks of global virtual teams.

The research question this paper seeks to ask is "How does social identity influence negative perceptions of others in global virtual teams?" The hypotheses tested examine the roles of social identity groupings (H1 and H2 below) and social capital (H3) as well as in-group brokerage and interactions (H4 and H5) on (negative) perceptions of other group members in global virtual teams.

More specifically, we seek to clarify the sources and effects of intergroup bias in MNE global virtual teams by relating bridging (connecting unconnected actors) and bonding (closure relationships) social capital with intergroup bias.[2] We emphasize the role of *in-group* interactions as a major source of intergroup bias because the collective identity of actors conveys both motivational and cognitive stimuli that can surface as, inter alia, prejudice, stereotyping and discrimination (Hewstone et al., 2002; Tajfel and Turner, 1985), even when no intergroup conflict exists (Struch and Schwartz, 1989). To evaluate our hypotheses, we collected and analysed network data on (a) hindrance, relational tension, and self-interest-based ties (*negative perceptions*), and (b) trust, shared identity, and resource-based ties (*positive perceptions*) from 160 actors across 40 global virtual teams embedded within three separate organizations. From this sample, we detected 34 social identity groups and analysed the effect of bridging and bonding social capital, both within and between groups, on the tendency of individuals to perceive others negatively. Higher centrality and brokerage scores *within* social identity groups (but not beyond) predicted increasingly negative views of out-group members. Similarly, higher group density in positive, as well as negative ties, are found to promote negative perceptions of actors outside those identity groups.

We make three key contributions to current knowledge. First, our findings suggest that prior studies have undervalued the role of social identification in inducing negative perceptions between groups. Identification has been an implicit part of social capital (Coleman, 1990; Nahapiet and Ghoshal, 1998), but we emphasize it as an *explicit* mechanism that can underpin negative perceptions in the context of global virtual teams. Second, we contribute to the cross-disciplinary nature of social network research (Kilduff and Krackhardt, 2008) by combining social identification with social capital research and research on global virtual teams. Thus, we offer new insights into identification and relational configurations, which can be seemingly beneficial but may also simultaneously induce undesirable effects for MNEs. Finally, our findings yield practical implications for MNE managers and leaders who wish to improve the organizational atmosphere or group dynamics through optimal structuring of international employee interaction.

## 2. Theory and hypotheses

Social capital has been defined in an OECD publication (Keeley, 2007, p.103) as "networks together with shared norms, values and understandings that facilitate co-operation within or among groups". Benefits of the concept are well established: increased salary, better chances of promotion and access to diverse skills and knowledge (e.g. Burt, 1997; Inkpen and Tsang, 2005), increased innovation, adaptation and organizational learning (Tsai and Ghoshal, 1998). On a broader scale, these benefits characterize "the sum of the *actual* and *potential* resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (Nahapiet and Ghoshal, 1998, p. 243). We adopt this definition because it includes actual (i.e. information) *and* potential resources (i.e. opportunities), as well as individual *and* social unit (i.e. identity group) as levels of analysis. Social capital research has identified two main conduits for resource flows: bridging and bonding ties (Adler and Kwon, 2002). Bonding social capital emphasizes close relationships within impermeable group boundaries, while bridging underlines connecting unconnected people.

In the context of global virtual teams, lack of cohesion within and across teams can be problematic because the success of the relationship is largely determined by acceptance, understanding, and adoption of common behavioural norms (Cropanzano and Mitchell, 2005). These are particularly salient issues for MNE teams because of geographic distribution (Gibson and Gibbs, 2006; Hinds and Mortensen, 2005). Furthermore, geographic dispersion implies absence of strong relationships (e.g. described by friendship, trust, and shared identity) (see also Crisp and Jarvenpaa, 2013, on swift trust in temporary systems). It is now well established that lack of face-to-face interaction often leads to weaker bonds and lack of integrated goals (Fiol and O'Connor, 2005). Technologically mediated communication used in MNE teams are poor mediums for forming strong relationships, sharing knowledge

---

[1] In-group can be defined as a social group to which an individual identifies membership. Out-group is a group where an individual does not identify him/herself as being part of. In-groups and out-groups classification identifies people into 'us' and 'them' (see Tajfel et al., 1971, for further discussion).

[2] A bridging tie traditionally exists when two actors are tied to the ego, but are not connected themselves (Borgatti and Halgin, 2011). Brokerage role in this case would also imply highest (degree of) centrality. The concept of bridging tie itself draws on betweenness centrality (Burt, 1992; Freeman, 1977), and unsurprisingly, brokerage and centrality measures have been found to be highly correlated (Friedman and Podolny, 1992). In order to offer a comprehensive analysis on the effects of structural network configurations that may induce intergroup bias, we included centrality into our broader definition of bridging ties.

(especially tacit knowledge), and coordination of complex tasks across the globe (Clear and MacDonell, 2011; Fiol and O'Connor, 2005; Hinds and Bailey, 2003; Hinds and Mortensen, 2005).

However, Pinjani and Palvia (2013) show that deep level diversity has a more significant relationship with team processes of mutual trust and knowledge sharing than invisible functional diversity. This relationship is moderated by the collaborative capabilities of available technology and with levels of independence of the task. Knowledge sharing and mutual trust mediate the relationship between diversity levels and team effectiveness. The media of knowledge sharing can be an important determinant of the efficacy of knowledge sharing, dependent on the cultural and linguistic variation in the team (Klitmøller and Lauring, 2013). Daim et al. (2012) show that communication breakdowns in virtual teams can arise from areas such as trust, interpersonal relationships, cultural differences, leadership and technology. It is clear that social identity and subgroup interactions are important determinants of perceptions of other team members and therefore on the effective outcomes of global virtual teams.

In a group social capital model by Oh et al. (2006), in-group bonding occurs through strong, positive, multiplex, and reciprocated relationships, and in-group bridging via vertical (i.e. connections to supervisors) and horizontal ties (i.e. connections to sub-groups). Similarly, intergroup social capital flows through vertical and horizontal ties. We build upon this model by adding effects of social identification, intergroup bias, and negative out-group perceptions. Oh et al. (2006) suspected that excessive closure may induce in-group and out-group bias and have a damaging impact on group effectiveness, but did not explore them in any greater detail. We analyse these effects empirically and shed light on specific mechanisms and conditions that induce such outcomes. This analysis relates to increasing recognition of negative effects involved in social networks. For example, shared identity can bind people together so tightly that they fail to perceive new opportunities (Maurer and Ebers, 2006), and excluded members considered psychologically distant and subjected to unethical behaviour (Brass et al., 1998). While bonding ties can be beneficial for conformity and cooperation (Adler and Kwon, 2002) they pose constraints and inertia on individual members (Zaheer et al., 2010). Bonding ties thus emphasize positive interactions, attitudes and behaviours within groups (Chattopadhyay et al., 2004; Tsui et al., 1992), but also imply salient group boundaries where members belonging to in-group and out-groups are clearly separated.

This type of cohesiveness in SIT underscores personalization of group members and increased self-esteem (Hogg and Turner, 1985; Tajfel, 1978). Simultaneously, bonding can lead to depersonalization and stereotyping out-group members as well as polarization of groups into rival camps (Ashforth and Mael, 1989; Horwitz and Rabbie, 1982). A high degree of bonding also suggests structural configurations that lack structural holes (Portes and Sensenbrenner, 1993), which may imply suboptimal outcomes like redundancy and in-group favouritism (Burt, 2000; Hewstone et al., 2002). Theoretically, bonding underpins shared identity, and closely relates the need for a coherent set of self-cognitions within group (Abelson et al., 1968; Heider, 2013). In order to maintain balance in relationships, people avoid negative information and seek positive reinforcement that reduces potential discord within their close relationships (Newcomb, 1961). The need for shared perceptions of "self" can hence lead to increasingly unfavourable impressions of out-group members (Shah et al., 1998). Thus:

**H1.** Individuals develop increasingly negative perceptions of out-group members in global virtual teams as their social identity group becomes closed.

Additionally, numerous negative ties within groups make it difficult to avoid negative information, build coherent self-cognitions, and enhance self-esteem. Discord within the group may be well reflected to other employees outside the social identity group. Barsade (2002) offers a model of emotional contagion occurring in multiple stages. Emotional contagion can be defined as "a process in which a person or group influences the emotions or behaviour of another person or group through the conscious or unconscious induction of emotion states and behavioral attitudes" (Schoenewolf, 1990, p. 50). The expressions of emotions are perceived by other group members via verbal or non-verbal signals. The next step in the process is receipt of feedback from mimicking others' perceptions or behaviours (Barsade, 2002). This process can occur either consciously or subconsciously (Barsade et al., 2009). Moreover, Rozin and Royzman (2001) suggest that humans give stronger weight to negative entities (e.g. events, objects or personal traits). This happens due to negative entities being stronger, more rapidly growing, more dominant (over positive entities) and more varied than positive ones (see Rozin and Royzman, 2001, for further discussion and evidence). Similarly, Barsade (2002) suggests that negative emotions are more likely to lead to mood contagion than positive ones. Consequently, it is likely that individuals with high exposure to negative ties within their social identity groups will be affected by the contagious negative emotions dominant in their in-group interactions. This may also influence the normative level of negativity towards others adopted by the individual. Given the strong contagious effects of negative emotions and their dominance in building perceptions, we expect that the negative perceptions would radiate towards out-group members.

**H2.** Individuals develop increasingly negative perceptions of out-group members in global virtual teams as the density of negative ties within their social identity group grows.

_Reciprocity_ is also a key mechanism in social interactions as it supports and maintains social equilibrium and relational cohesion (Simmel and Wolff, 1950). It depicts the tendency towards two-way interactions such as returning favours and advice. Hence, balance is achieved when people have established mutual relations among them (Heider, 2013). Reciprocity represents the extent to which actors are connected to each other through relational obligations and mutual dependence (Gouldner, 1960). Not surprisingly, reciprocity is found to be an important aspect of social capital (Oh et al., 2006).

Beyond the traditional normative expectation towards reciprocity, presence of conflict or negativity between team members influences calculations in exchange relationships and hence influences development of social capital in global virtual teams. As argued by Cameron and Webster (2011), negative perceptions lead to less successful exchanges since fairness, reciprocity, and common understanding cannot be counted upon. Unfair exchanges naturally link to further anger, frustration, disappointment, and in

general less favourable perceptions of exchange partners (Homans, 1958). Importantly, individuals also tend towards "negative reciprocity" and return negative treatment in a similar manner and exact revenge according to the size of perceived wrongdoing (Eisenberger et al., 2004).

According to the in-group reciprocity hypothesis (Rabbie et al., 1989), discrimination of out-group members stems from the self-interest-based desire to maximize favourable in-group allocation of resources (Gaertner and Insko, 2000). Discrimination has been noted to be especially strong in positively perceived resources (Mummendey et al., 1992). Hence, we hypothesize that:

**H3.** Negative perceptions of individuals towards out-group members will increase when in-group social capital is highly reciprocal in global virtual teams.

In contrast, bridging social capital emphasizes ties between different people (Adler and Kwon, 2002). Bridging may alleviate overly cohesive intra-group interactions because it develops personal trust among parties (Newell et al., 2004). However, bridging is a delicate balancing act due to the potential for conflicting demands and interests. Goal incongruences could give rise to perceptions of double standards and apparent hypocrisy with regards to how actors who bridge ties share information and resources (Hogg and Terry, 2000). Brokering can be considered as individualistic rather than communitarian behaviour because brokers display different beliefs and identities with different people (Burt, 2000, p. 354). Instead of emphasizing harmony and collective goals, brokers often aim to achieve task-related outcomes and their personal goals (Xiao and Tsui, 2007). Indeed, the success of a broker is predicated upon playing actors' conflicting interests against each other (Burt, 1992, p. 34). Brokers are therefore often at the heart of conflicting demands vis-á-vis their own aspirations, and they must tread carefully within the social fabric of an organization in order to succeed. Arising from the sensitivity towards the reactions of others, actors who establish bridging ties may be more inclined to perceive others in *negative* terms than others:

**H4.** Actors in global virtual teams with a high degree of in-group brokerage perceive out-group members more negatively than do non-brokers.

The extent to which an actor is focal to specific interaction patterns of a group – namely *in-group centrality* – also shapes intergroup interactions. Centrality relates to higher levels of access and control over valuable resources (Burt, 1992), informal leadership (Freeman et al., 1979) and significant power over others (Brass, 1992). Hence, central actors are valued as prestigious members of the group. An analogous argument is that actors who are tied to powerful and influential people become influential themselves. Consequently, Bonacich (1987, p. 1181) argued that "one's status is a function of the status of those one is connected to". Therefore, inter-group status differentials are likely to be defended by the in-group members (Carton and Cummings, 2012). Previous studies suggested that high status individuals tend to show stronger in-group bias than do low status category individuals (Hewstone et al., 2002). This bias is likely to be stronger if high status individuals perceive the intergroup status gap to be closing (Hewstone et al., 2002; Sachdev and Bourhis, 1991). Individuals central to a group are motivated to defend group status as it is likely to positively contribute to their social identity more strongly than it does for peripheral members. Therefore, we expect centrality of individuals within a group to encourage their in-group bias. This bias is likely to translate into stronger negative perceptions towards out-group members. Moreover, when central network actors within groups possess influence and power they might experience stronger cognitive commitment with the group and perceive out-group members as being disconnected and different. In contrast, peripheral members are likely to experience lower levels of attachment to that group than do central people. Thus:

**H5.** Actors in global virtual teams who are central to in-group interactions perceive out-group members more negatively than do non-central actors.

## 3. Methods

### 3.1. Research setting and sample

Survey participants in this study came from three large Finnish MNEs (see Table 1 below for more detailed description). All three companies are embedded within knowledge-intensive industries where tightening competition creates a need towards flexible customer solutions and organizational structures on a global scale. Working titles such as development manager, product manager, application specialist, sourcing manager, component engineer, and customer service manager are common in all three participating firms. Teams are therefore highly knowledge-based and draw their competitive advantage from effective transfer of knowledge and expertise of team members.

The survey was administered in early 2012 to 160 employees and received an average response rate of 82%, which is well within accepted boundaries when using such relational research design (Kossinets, 2006; Wasserman and Faust, 1994). Fig. 1 shows a detailed breakdown of data sources. The individuals reside in 40 teams within four units in the three firms. The global virtual teams investigated were geographically dispersed across 19 countries and 50 geographical locations. A considerable amount of interaction and coordination between team members therefore takes place through virtual and computer-aided systems. The executives and CEOs provided additional information about their teams and team members. This information included the official structure of the teams as presented in organisational charts (i.e. who reports to whom), as well as work location and the nationality of each individual. Employees were asked to evaluate their relationships with all other people within their unit. This produced four intra-unit networks. Naturally, these units were split between specific teams, which were identified through organisational charts from the participating companies. Thus, unlike most studies on micro-foundations of MNE teams (Haas and Cummings, 2015) this allowed us

**Table 1**
Description of surveyed companies.

| | Industry | Core purpose | Size | Scope |
|---|---|---|---|---|
| Firm 1 | Steel and construction | To provide innovative and energy efficient solutions for better living and working. | Net sales in 2012 totalled around 3 billion euros | 9000 employees globally, network of dealers and distributors across 30 countries from Finland to South America |
| Firm 2 | Indoor climate and plumbing | To provide innovative solutions (i.e. plumbing, heating, and cooling) that are sustainable, safe, and reliable, to both commercial and residential customers. | Turnover of 811 million euros in 2012 fiscal year | 3200 employees globally |
| Firm 3 | Telecommunications | Global contract manufacturer and systems supplier for communication and electronics (mobile phone and ADSL networks and testing and assembling of modules, electronic modules, circuit boards, and cables). | Turnover in 2012 was over 40 million euros | Production plants across Europe and China. Current number of employees is around 2000 |
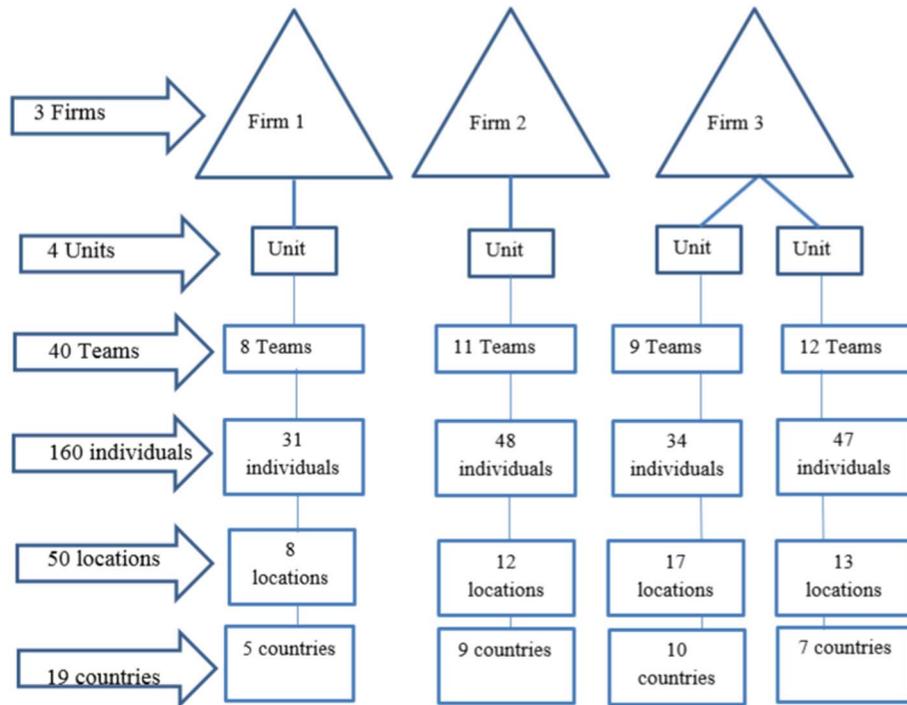
**Fig. 1.** Breakdown of data sources.

to also evaluate the effect of bridging and bonding on intergroup bias in global virtual teams. These are stable teams within a well-defined organizational structure, with interdependence, common goals, and long-term strategy. Name rosters helped to reduce measurement error, assist with recall, and enhance overall measurement reliability (Marsden, 1990). Sociometric questionnaires frequently utilize this type of one-item approach to identify each specific network relation (Borgatti and Cross, 2003). Despite potential validity issues, research has found one-item questions to be reliable when combined with the roster method (Marsden, 1990) and relatively long-term interactions (Freeman et al., 1987). This is especially the case when collecting large amounts of data about total networks in a relatively short period of time and at low cost (Fu, 2005; McCarty et al., 1997). The respondents first identified the people with whom they "have regular communications, exchanges or dealings with". Respondents were then asked to report on the extent to which they disagree or agree (on a Likert-scale of 1 to 6) to the statements they were presented with. An on-line survey was used to collect data. On average, the survey took 15 min to complete. Outside of our survey, initial informal interviews with managers and executives revealed that the nature of interaction between team members follow a relatively "normal" workplace pattern: meetings, phone calls, brainstorming sessions, training events, project collaborations and the like. The main methods of communication included a combination of face-to-face interactions, telephone, Skype, email and conference calls with live video feed.

### 3.2. Dependent variable: negative perceptions of out-group members

In order to analyse the effect of bridging and bonding on intergroup bias in global virtual teams, we conceptualized the negative perceptions of network members through relational tension, self-interest, and hindrance ties (see Table 2 for specific questions). Prior

**Table 2**
Factor analysis of network relationships.

| Construct | Item | Question | Mean | SD | Factor loading |
|---|---|---|---|---|---|
| Negative perceptions | Hindrance ties | This person makes it difficult for me to carry out my job responsibilities (i.e. by withholding information, opportunities, and resources) | 1.41 | 0.67 | 0.96 |
| | Self-interest | This person sometimes puts their own interests ahead of others | 1.42 | 0.62 | 0.89 |
| | Relational tension | I often feel uncomfortable when working with this person | 1.89 | 0.92 | 0.94 |
| Social Capital (positive ties) | Trust | I can rely on this person when it comes to work-related issues | 4.70 | 1.05 | 0.95 |
| | Resources | This person is a good source of information, ideas, resources and opportunities | 4.58 | 1.09 | 0.97 |
| | Similar values | This person shares similar values, ways of thinking, and understanding to my own | 4.46 | 0.99 | 0.96 |

Note. N = 160, items were measured from 1 (strongly disagree) to 6 (strongly agree).

studies in conflict and negative relationships have most commonly utilized four-item scales derived from Jehn (1995). We opted for an alternative measure for two reasons. First, our purpose was to analyse negative perceptions at the interpersonal rather than group level. Our informal pilot testing indicated that having several scales is overly cumbersome and time-consuming for the respondents because respondents would need to evaluate every individual they communicate with in terms of all four-scale items. Second, while there are informative studies that focus on analysing organizational outcomes of relational problems at the interpersonal level, these tend to have a relatively superficial conceptualization of conflicting relationships. For instance, Schulte et al. (2012) provided interesting insights into coevolution of network ties and individual's perceptions, but their key empirical measure 'Do you have a difficult relationship with this person?' ignores both specific *nature* and *strength* of that relationship. As suggested by Rozin and Royzman (2001), the most dramatic effects should occur when there are simultaneous manifestations of different types of affective conflict. Consequently, *relational tension*, 'I often feel uncomfortable when working with this person', was phrased after previous conflict studies (Hinds and Mortensen, 2005; Jehn, 1995; Verbeke and Bagozzi, 2000) utilizing measures of relational tension, anxiety, and uneasiness at the interpersonal level. *Self-interest* was similarly based on previous studies on opportunistic and self-centred behaviour (Das and Teng, 2000; Villena et al., 2011) as 'This person sometimes puts their own interests ahead of others'. Finally, our measure of *hindrance ties* was based on previous studies on how people can make it difficult for organizational members to carry out their responsibilities (Sparrowe et al., 2001) through the withholding of important information, resources or opportunities. Thus, we asked respondents to indicate the extent to which 'This person makes it difficult for me to carry out my job responsibilities (i.e. by withholding information, opportunities, and resources)'. Thus, these variables are at a dyadic-level and each respondent reported the extent to which they perceive each of their network members negatively. Scores of these three sociomatrices were summed together for total network liability. We further utilized a procedure developed by Krackhardt and Stern (1988) for investigating the embedding of network ties within and between groups. This E-I (external-internal) index (calculated from the above-mentioned negative ties) ranges from $-1$ (all ties occur within group) to 1 (all ties occur between groups).

### 3.3. Independent variables: social capital

In accordance with the above analysis, we measure social capital through trust, shared identity, and access to new resources (see Table 2 for specific questions). *Trust* is an important component of relational social capital because it promotes, amongst other things, cohesion, unity of direction, and cooperation (Granovetter, 1985; Zahra et al., 2006). Not surprisingly, trust is regarded as one of the main manifestations of social capital (Leana and Van Buren, 1999). Thus, we measured trust as 'I can rely on this person when it comes to work-related issues'. Shared *identity* relates to the cognitive aspect of social capital (shared norms, values, and attitudes), and is a significant factor in unifying individuals towards a common goal (Parkhe, 1993; Villena et al., 2011). This, in turn, can improve organizational capabilities and reduce opportunistic behaviour among network members (Kogut and Zander, 1992). We measured shared identity as 'This person shares similar values, ways of thinking, and understanding to my own'. Access *to new resources* facilitates value creation through the sharing of important information, exchange of favours, and coordination and combination of skills (Lin, 2002). Classic network research has found that social capital increases access to the latest research (Coleman, 1988), innovative ideas (Burt, 1987), and job opportunities (Burt, 1992). Hence, accessing new resources and information is one of the most important and commonly cited components of social capital (Adler and Kwon, 2002; Tsai and Ghoshal, 1998). Thus, we measured accessing new resources as 'This person is a good source of information, ideas, resources and opportunities'. Because these positive relationships are highly interconnected, we combined them into one valued multiplex graph (by taking the average value of each metric) to form our measure of social capital. Thus, in this graph, actors were connected by overlapping social capital relationships, hence reflecting the extent of positive network interactions.

Principal component factor analysis revealed that the items loaded on a single factor (see Table 2 below). For social capital, the first principal component explained 93.5% of the variance, and loadings on the first principal component ranged from 0.97 to 0.95. Cronbach's alpha for the three items was 0.96. For negative perceptions of out-group members, the first principal component explained 87.4% of the variance, and loadings on the first principal component ranged from 0.96 to 0.89. Cronbach's alpha was 0.90.

### 3.4. Network measurements

#### Network centrality

Actor centralities were calculated using the so-called Bonacich approach (Bonacich, 1987). This approach computes network centralities as a product of the prestige of those whom people are connected to. Theoretically actors whose networks consist of other central actors are considered to possess higher standing and power than those whose networks include more peripheral individuals. Technically, this is measured as $C(\alpha,\beta) = \alpha(I - \beta R)^{-1}R1$, where $\alpha$ is a scaling vector (for normalizing the score), $\beta$ a parameter weight for centrality of ego's connections, $R$ is the valued adjacency matrix, $I$ is the identity matrix, and 1 is a matrix of all ones. We separately calculated in-group centralities and out-group centralities (ties *only within* identity groups and *all ties outside* those identity groups) in order to evaluate effects of being connected to other well-connected individuals within and outside of the respondent's social identity group.[3]

---

[3] Our in-group centrality beta value was 0.09 and out-group beta 0.06. Beta values close to zero are similar to that of the out-degree of each actor (Bonacich, 1987). In order to ensure that our centrality measure did not overlap with out-degree, we tested the difference between these variables through node-level ANOVA (5000 permutations). Results showed that these variables were significantly different (at p < 0.001) and hence did not overlap.

*Brokerage*

Brokerage was measured as a function of the number of times a person connects two others who are unconnected by a network tie within an identity group. This measure is similar to the coordinator role suggested by Gould and Fernandez (1989). We further used an out-group brokerage variable to analyse the effect connecting any unconnected individuals outside of the focal actors' membership group.

*Reciprocity*

Reciprocal connection between two actors exists if there is a tie between *i* and *j* as well as between *j* and *i* (Wasserman and Faust, 1994). In order to examine the level of in-group reciprocity, we utilized the so called dyad method, which calculates the proportion of reciprocated ties among pairs of actors who are connected to each other (Hanneman and Riddle, 2005). We also measured the degree of actors' reciprocity outside of their identity groups.

*Density*

Positive and negative group densities were calculated as a proportion of network ties that were actually present from the total number of potential connections within social identity groups. We then assigned each individual actor a value corresponding to his or her identity group. Individuals' network density outside their membership groups were also calculated as a proportion of present ties to total potential ties in the network.

*Tie strength*

In order to separately analyse the strength of relationships, we measured in-group tie strength as the sum of valued positive ties within each identity group. We then assigned each individual actor a value corresponding to their membership group. Out-group tie strengths were calculated as the sum of valued ties with other identity groups.

### 3.5. Control variables

In order to rule out alternative explanations we included individuals' network size (number of people), gender (dummy variable), co-location (dummy variable equals one if the person works in the same office), team membership (dummy variable equals one if the person works in the same official team), and supervisory position (dummy variable equals one if in a supervisory position) in our analyses. Demographic attributes and leadership may affect how social network ties emerge and are perceived (Brass and Krackhardt, 1999; McPherson and Smith-Lovin, 1987). Physical proximity (co-location) and team membership can enhance social identification processes, and are therefore potential sources of strong categorization and stereotyping (Stahl et al., 2010). Gender, geographical location, team structures, and leadership position were extracted from company archival data, and network size calculated by summing ego's direct connections.

### 3.6. Identification of groups

In accordance with previous studies (Kadushin, 1995; Labianca et al., 2001; Nelson, 1989), we identified groups by utilizing a CONCOR clustering algorithm (Breiger et al., 1975). CONCOR partitions the network matrix into blocks based on correlations of column vectors until convergence has been reached, and separates positive and negative correlations into blocks until all groupings are identified. We used perceptions of shared identity to partition the network, and 37 groups were identified. Groups ranged from three to 10 individuals. CONCOR was utilized because our purpose was to investigate social identity as a function of perceptions of social self and, consequently, we wanted to maintain comparability with previous studies on social identity (Leonard et al., 2008; Mehra et al., 1998). Hence, we emphasize that collective sharing of values takes place within the *social unit* (Nahapiet and Ghoshal, 1998), which can transcend official team structures.

### 3.7. Analytical procedures

Initially, we analysed the distribution of social liability ties within and across social identity groups. Negative perceptions external to the actors' own social identity groups were considerably more common than negative ties within those groups. The former covered 80% and the latter only around 20% of all negative ties. E-I index (highly significant at $p < 0.001$) revealed that social liability (i.e. negative) ties primarily extend to individuals outside the actors' own social identity groups.

Fig. 2 illustrates this tendency diagrammatically. The nodes represent individuals in five identity groups. The groups are represented by five different shapes of nodes. The links show ties between the individuals. The links connecting the nodes of the same shape are *within* group ties, while the links connecting the nodes of different shapes are *between* group ties. The figures show that even though positive ties exist *within* and *between* identity groups (Fig. 2a), negative perceptions are located almost exclusively *between* the groups (Fig. 2b). As observed by Labianca and Brass (2006), negative ties are on average less common than positive ties.

We tested each of our hypotheses by conducting a node-level quadratic assignment procedure (QAP) regression. This procedure first performs a standard multiple regression across the dependent and independent vectors. It then permutes cells for the dependent vector, and the regression procedure is repeated with the new permutated dependent vector. Coefficients and $R^2$ values are saved. The second step is repeated 10,000 times in order to create a sampling distribution against which the original coefficient can be compared. Social network data cannot be assumed to be independent, and standard statistical tests cannot be applied (Krackardt,
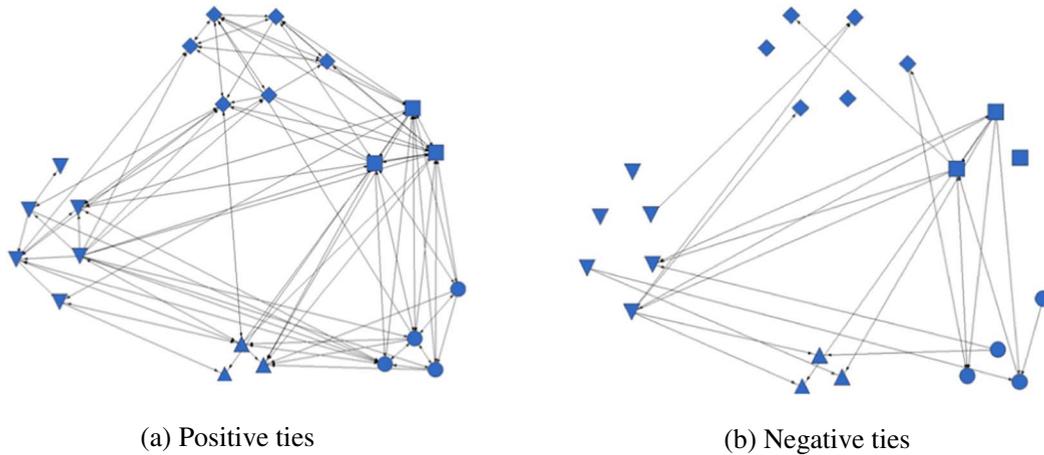
(a) Positive ties                                          (b) Negative ties

**Fig. 2.** Graphical representation of intergroup bias in negative network ties.
Notes: The nodes represent individuals. Shapes of nodes represent five identity groups included in the figure. The links show ties between the individuals.

1987). The QAP approach provides a robust indicator of unbiased significance levels and standard errors because it preserves the dependence in both the dependent and independent variables.

## 4. Results

First correlations and descriptive statistics were generated (see Table 3). This was followed by a regression analysis of the factors affecting the creation of negative out-group perceptions.

We proceeded in a stepwise manner. Table 4 demonstrates the relative importance of each independent variable (in terms of beta coefficients and $R^2$ values) in predicting negative out-group perceptions. H1 predicted that negative perceptions of *out-group* members in global virtual teams increase as social capital *within* identity groups become dense. This was partly supported because the density coefficients were significant in models 4 and 5 (at $p < 0.05$). However, density only moderately improved the overall $R^2$ value of the model and we cannot conclusively confirm its effects in inducing increasingly negative perceptions towards out-group members. Our measure of in-group tie strength did not indicate any significant effects. H2 predicted that higher density of *negative* in-group ties also increases negative perceptions towards out-group members. This was strongly supported, as the beta coefficients associated with negative density were significant (at $p < 0.001$) and considerably improved the related $R^2$ values. Our third hypothesis predicted that in-group reciprocity increases negative evaluations of outsiders. No support for this was found, and beta values were non-significant. H4, stating that in-group brokering increases intergroup bias, was also strongly supported. The results showed a pattern that high in-group brokerage scores were significantly (at $p < 0.05$) associated with negative perceptions of out-group members. Finally, H5, which predicted that centrality of in-group interactions increases negative out-group views, was supported. The beta coefficients associated with centrality were significant (ranging from $p < 0.001$ to $p < 0.01$) in five out of the seven models.

Adjusted $R^2$ values in our baseline model improved considerably from 0.02 to 0.43 after the inclusion of additional network variables. Our full model therefore provided significant explanatory power in evaluating the mechanisms behind the intensification of negative perceptions within intra-organizational networks (see Table 5 below for summary of the results).

Negative out-group perceptions also raised a question of possible organizational outcomes. Post hoc tests examined the relationship between negative perceptions and perceived organizational performance. We used a double Dekker semi-partialling method because it minimizes collinearity, which is common for network data (Dekker et al., 2005). Extant research is relatively consistent in that both *effectiveness* (quality of work) and *efficiency* (quantity of work) are central to performance measurements (Franco-Santos et al., 2007; Magnusson et al., 2014). Accordingly, respondents rated on a 1–6 Likert-type scale whether "*This person's quality and quantity of work is higher than formal standards*". We expected the presence of a negative perception to increase the likelihood of being perceived as a poor performer (Labianca and Brass, 2006). Vice versa, social capital should enhance perceptions of high performance. Correlations and descriptive statistics are presented below (Table 6).

Performance was recoded from 1 (low) to 3 (very low) to assess the effect of negative ties. Control variables were transformed from vector to matrix-format so that $X(ij) = 1$ if vector i = vector j and 0 if otherwise. Next, a series of quadratic multiple regressions (10,000 permutations) were performed by regressing each element in the performance matrix on its corresponding element in each negative perception matrix. All three types of negative perceptions were significant (at $p < 0.001$), and the $R^2$ values indicated that these ties reduce the uncertainty involved in predicting perceptions of poor performance by 20% (Table 7).

Another series of analyses was run by regressing the performance variable (values ranging from 1 to 6) on trust, similar values, and resource matrices. The $R^2$ value of 0.59, and significance levels of $p < 0.001$, indicated that social capital provided an exceptionally potent indication of individuals' perceived performance.

**Table 3**
Correlations and descriptive statistics.

| | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Co-location | 2.86 | 2.18 | | | | | | | | | | | | | | | | |
| 2 Gender | 1.28 | 0.45 | −0.14 | | | | | | | | | | | | | | | |
| 3 Supervisor | 0.43 | 0.5 | −0.19 | −0.12 | | | | | | | | | | | | | | |
| 4 Team membership | 18.96 | 10.17 | 0.35 | −0.09 | −0.17 | | | | | | | | | | | | | |
| 5 Network size | 14.78 | 6.13 | −0.15 | −0.08 | 0.26 | −0.29 | | | | | | | | | | | | |
| 6 Centrality, in-group | 3.1 | 12.26 | 0.03 | 0.01 | 0.02 | 0.13 | −0.02 | | | | | | | | | | | |
| 7 Centrality, out-group | 6.88 | 10.53 | 0.02 | −0.12 | −0.01 | −0.12 | −0.32 | −0.16 | | | | | | | | | | |
| 8 Brokerage, in-group | 1.31 | 2.1 | −0.07 | −0.05 | 0.01 | 0.06 | 0.07 | 0.38 | −0.24 | | | | | | | | | |
| 9 Brokerage, out-group | 64.08 | 59.75 | −0.17 | −0.11 | 0.11 | −0.09 | −0.01 | −0.2 | 0.29 | 0.1 | | | | | | | | |
| 10 Positive density, in-group | 0.84 | 0.55 | −0.11 | 0.04 | −0.04 | 0.13 | 0.05 | 0.22 | −0.2 | 0.25 | 0.07 | | | | | | | |
| 11 Positive density, out-group | 0.41 | 0.21 | 0.03 | 0.02 | −0.07 | 0.04 | 0.01 | 0.07 | 0.06 | −0.06 | −0.27 | −0.03 | | | | | | |
| 12 Reciprocity, in-group | 0.22 | 0.3 | −0.14 | 0.05 | 0.05 | 0.16 | 0.18 | 0.1 | −0.36 | 0.09 | −0.11 | 0.09 | 0.12 | | | | | |
| 13 Reciprocity, out-group | 0.09 | 0.12 | 0.02 | −0.16 | 0.13 | 0.17 | 0.14 | 0.22 | −0.25 | 0.16 | −0.1 | 0.12 | 0.09 | 0.3 | | | | |
| 14 Negative density, in-group | 0.2 | 0.25 | 0.05 | −0.09 | −0.04 | 0.23 | 0.15 | 0 | −0.18 | −0.06 | 0.06 | 0.21 | −0.14 | 0.1 | 0.1 | | | |
| 15 Negative density, out-group | 0.19 | 0.39 | −0.04 | −0.04 | −0.02 | 0.11 | 0.09 | 0.07 | −0.2 | −0.02 | −0.09 | 0.08 | 0.37 | 0.12 | 0.14 | 0.14 | | |
| 16 Tie strength, in-group | 23.04 | 24.03 | −0.09 | 0.11 | −0.02 | 0.12 | 0.02 | 0.72 | −0.3 | 0.52 | −0.14 | 0.64 | 0 | 0.15 | 0.15 | 0.11 | 0.12 | |
| 17 Tie strength, out-group | 60.46 | 37.12 | −0.21 | 0.07 | −0.04 | −0.05 | −0.07 | 0.13 | 0.02 | 0.39 | 0.3 | 0.59 | −0.14 | −0.09 | −0.03 | −0.05 | 0.06 | 0.55 |

Notes: 10,000 permutations for estimating standard errors; N = 160, correlations equal to 0.16 are significant at p < 0.05, correlations equal to 0.16 are significant at p < 0.05, correlations equal to 0.21 are significant at p < 0.01, and correlations equal to 0.26 are significant at p < 0.001.

**Table 4**
Regression of network variables on negative out-group perceptions.

|  | Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
|  | Co-location | − 0.11 | − 0.10 | − 0.07 | − 0.05 | − 0.05 | − 0.05 | − 0.04 |
|  | Gender | 0.04 | 0.01 | 0.04 | 0.03 | 0.02 | 0.06 | 0.05 |
|  | Supervisor | − 0.01 | − 0.03 | − 0.02 | − 0.01 | − 0.01 | 0.02 | 0.01 |
|  | Team membership | 0.20* | 0.12 | 0.12 | 0.09 | 0.10 | 0.10 | − 0.01 |
|  | Network size | 0.19* | 0.15 | 0.14 | 0.14 | 0.14 | 0.05 | 0.06 |
| H5: | Centrality, in-group |  | 0.41*** | 0.34** | 0.31** | 0.32** | 0.31** | 0.23 |
|  | Centrality, out-group |  | − 0.08 | − 0.05 | − 0.02 | − 0.03 | 0.03 | 0.03 |
| H4: | Brokerage, in-group |  |  | 0.23* | 0.21* | 0.22* | 0.30** | 0.27* |
|  | Brokerage, out-group |  |  | 0.03 | 0.01 | 0.01 | − 0.03 | − 0.02 |
| H1: | Positive density, in-group |  |  |  | 0.16* | 0.16* | 0.08 | 0.01 |
|  | Positive density, out-group |  |  |  | 0.00 | 0.00 | 0.03 | 0.03 |
| H3: | Reciprocity, in-group |  |  |  |  | 0.00 | 0.00 | 0.00 |
|  | Reciprocity, out-group |  |  |  |  | − 0.05 | − 0.06 | − 0.05 |
| H2: | Negative density, in-group |  |  |  |  |  | 0.44*** | 0.43*** |
|  | Negative density, out-group |  |  |  |  |  | 0.06 | 0.06 |
| H1: | Tie strength, in-group |  |  |  |  |  |  | 0.15 |
|  | Tie strength, out-group |  |  |  |  |  |  | 0.00 |
|  | $R^2$ | 0.06 | 0.25 | 0.3 | 0.32 | 0.32 | 0.5 | 0.5 |
|  | Adjusted $R^2$ | 0.02 | 0.21 | 0.25 | 0.27 | 0.26 | 0.43 | 0.43 |

Notes: 10,000 permutations for estimating standard errors, N = 160.

  * $p < 0.05$.
  ** $p < 0.01$.
  *** $p < 0.001$.

## 5. Discussion

Recognition is growing that organizational networks and social capital are central to the success of individuals, teams and organizations (Borgatti and Halgin, 2011; Tsai and Ghoshal, 1998). Similarly, extant research has increasingly recognized the importance of understanding how team members share, distribute, and coordinate knowledge flows in MNEs (Kogut and Zander, 1993; Nohria and Ghoshal, 1997). While previous research has largely focused on knowledge sharing between MNE subsidiaries, in this research we have focused on micro-foundations of social capital in global virtual teams. Indeed, the mechanisms through which seemingly beneficial interactions generate adverse outcomes are inadequately understood. Little is known about how different types of network mechanisms and individual-level cognitions affect these negative manifestations. Consequently, we analysed the extent to which bridging and bonding social capital within identity groups relate to negative out-group perceptions. Negative ties and perceptions can have serious organizational ramifications in terms of underperforming teams.

As we hypothesized, bonding social capital within social identity groups is found to promote negative out-group perceptions. While cohesive and dense networks can advance conformity and cooperation, they simultaneously engender cognitive processes that highlight social categorization and the achievement of distinctiveness through shared norms and values. These processes emphasize increased intergroup bias, which was manifested as negative perceptions of out-group members. Density of negative ties within identity groups also promoted negative perceptions of out-group members. Negative stimulus weights more heavily than positive, and individuals may experience cognitive disturbance caused by negativity in their social group so heavily that it spills over to other parts of their network. We found no support for adverse effects of reciprocity within identity groups. This was surprising because, like cohesion and density, reciprocity relates to shared norms and dependence within groups (Rabbie et al., 1989). Low levels of reciprocation (10%) within social capital may have affected the ability of statistical procedures to discern reciprocity effects. Alternatively, reciprocity may operate through a distinct mechanism in comparison to density, thereby promoting beneficial human

**Table 5**
Summary of results.

| Hypothesis description | Model number | Outcome |
|---|---|---|
| H1: Individuals develop increasingly negative perceptions of out-group members in global virtual teams as their social identity group becomes closed. | 4–7 | Partially supported |
| H2: Individuals develop increasingly negative perceptions of out-group members in global virtual teams as the density of negative ties within their social identity group grows. | 6–7 | Supported |
| H3: Negative perceptions of individuals towards out-group members will increase when in-group social capital is highly reciprocal in global virtual teams. | 5–7 | Not supported |
| H4: Actors in global virtual teams with a high degree of in-group brokerage perceive out-group members more negatively than do non-brokers. | 3–7 | Supported |
| H5: Actors in global virtual teams who are central to in-group interactions perceive out-group members more negatively than do non-central actors. | 2–7 | Supported |

**Table 6**
Descriptive statistics and QAP Pearson correlations.

|   | Variable | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Performance | 4.37 | 1.01 | | | | | | | | | | | |
| 2 | Performance (poor) | 1.35 | 0.57 | 0.19 | | | | | | | | | | |
| 3 | Co-location | 1.00 | 0.00 | 0.11 | 0.03 | | | | | | | | | |
| 4 | Gender | 1.00 | 0.00 | 0.06 | 0.00 | 0.03 | | | | | | | | |
| 5 | Supervisor | 1.00 | 0.00 | 0.02 | 0.01 | 0.00 | − 0.01 | | | | | | | |
| 6 | Team membership | 1.00 | 0.00 | 0.24 | 0.09 | 0.10 | 0.04 | 0.02 | | | | | | |
| 7 | Relational tension | 1.89 | 0.92 | 0.16 | 0.29 | 0.02 | 0.02 | 0.02 | 0.07 | | | | | |
| 8 | Hindrance ties | 1.41 | 0.67 | 0.11 | 0.35 | 0.02 | 0.03 | 0.01 | 0.04 | 0.34 | | | | |
| 9 | Self-interest | 1.42 | 0.62 | 0.22 | 0.32 | 0.07 | 0.04 | 0.01 | 0.12 | 0.22 | 0.25 | | | |
| 10 | Trust | 4.70 | 1.05 | 0.70 | 0.16 | 0.14 | 0.08 | 0.02 | 0.28 | 0.16 | 0.11 | 0.28 | | |
| 11 | Similar values | 4.46 | 0.99 | 0.75 | 0.20 | 0.14 | 0.08 | 0.02 | 0.29 | 0.14 | 0.13 | 0.29 | 0.87 | |
| 12 | Resources | 4.58 | 1.09 | 0.76 | 0.19 | 0.14 | 0.08 | 0.02 | 0.30 | 0.15 | 0.12 | 0.30 | 0.91 | 0.93 |

Notes: 10,000 permutations for estimating standard errors; N = 160, correlations equal to 0.16 are significant at $p < 0.05$, correlations equal to 0.21 are significant at $p < 0.01$, and correlations equal to 0.26 are significant at $p < 0.001$.

behaviour (i.e. returning help and advice) without intensifying negative intergroup bias. Our hypotheses that in-group brokering and centrality enhance negative out-group bias were supported. These were highly correlated, and they may promote out-group negativity through cognitively similar mechanisms. This implies that these roles operate through individualistic goals and identities, instead of emphasizing harmonious and uniform in-group interactions (Xiao and Tsui, 2007). Hence, actors occupying bridging positions may be predisposed to perceiving others opportunistically. Thus, influence and control over resources within a group may imply increased identification and distinctiveness at the expense of maintaining positive attributions towards out-group members.

Our post-hoc analysis showed that out-group evaluations had a significant effect on the perceived performance: negative perceptions predicted low performance evaluations in global virtual teams. Negative perceptions may impede the flow of information and resources, which could make it difficult to achieve formal work standards (Labianca and Brass, 2006). Even mild negative emotions (i.e. dislike) may be relatively disruptive to performance evaluations because of reduced access to information and resources. In contrast, social capital provided a significant boost to performance evaluations. Overall, our findings imply a cognitive bias, which obstructs objective evaluations about the individual capabilities (such as performance) of those who they perceive negatively. Thus, negativity can be "self-perpetuating" in that these attitudes can escalate into even greater emotional negativity in a vicious circle (Raush, 1965).

We provide three key contributions to the current understanding of social networks and the psychological processes that underpin positive and negative interpersonal interactions in teams. First, we extend research on social capital (and social liabilities) by introducing the notion of negative intergroup bias into this stream of research. Specifically, we establish social identification as a cognitive mechanism underpinning the development of negative out-group perceptions and thus contribute to the cross-disciplinary nature of organizational network research. To the best of our knowledge, this study is the first systematic attempt to demonstrate how the structure of a network is linked to intergroup bias and negative perceptions of out-group members from both a theoretical and empirical standpoint. Our study fits well with two key issues in the organizational network literature: (i) that there is a curvilinear relationship between the optimal amount of social capital and potential rewards, and (ii) negative ties can be a major threat to the effective functioning of individuals and organizations. Our study adds to these discussions by examining the structure of seemingly

**Table 7**
The effect of social liabilities and social capital on perceived performance.

|  | Social liability (negative perception) models | | | | Social capital (positive perception) models | | | |
|---|---|---|---|---|---|---|---|---|
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Co-location | 0.00*** | 0.00 | 0.00 | 0.00 | 0.01* | 0.01* | 0.00 | 0.00 |
| Gender | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Supervisor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Team membership | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Relational tension |  | 0.23*** | 0.19*** | 0.15*** |  |  |  |  |
| Hindrance ties |  |  | 0.28*** | 0.23*** |  |  |  |  |
| Self-interest |  |  |  | 0.22*** |  |  |  |  |
| Trust |  |  |  |  |  | 0.50*** | 0.31*** | 0.12*** |
| Similar values |  |  |  |  |  |  | 0.47*** | 0.28*** |
| Resources |  |  |  |  |  |  |  | 0.41*** |
| $R^2$ | 0.00 | 0.08 | 0.15 | 0.20 | 0.00 | 0.48 | 0.57 | 0.60 |

Notes: 10,000 permutations for estimating standard errors, N = 160.
\* $p < 0.05$.
\*\* $p < 0.01$.
\*\*\* $p < 0.001$.

beneficial social capital networks from the perspective of social identity and negative perceptions of co-workers. We thus elaborate the curvilinear nature of social capital, and the conditions under which it can have adverse consequences by analysing social and structural mechanisms behind positive and negative interactions. There has previously been a limited empirical effort to quantify negative interactions beyond measurements such as "dislike". Our study quantifies several key elements of both social capital and negative relations, thus forming a foundation upon which future studies should be able to build when investigating both pro-social and counterproductive behaviours from an organizational network perspective. Finally, our results have implications for managers. An important question is how negativity can be minimized. Corrective action should be taken, at the latest, when a minor subconscious in-group bias surfaces as obstructive behaviour or quarrels between groups. A potential managerial tool to counteract excessive in-group/out-group division is structural alteration of workflow within and between identity groups. Re-categorization of groups could emphasize one common identity and superordinate goal between group members (Dovidio et al., 1998). Social interaction between in-group and out-group members and resulting personalization of out-group members could reduce the salience of divisions between in-group and out-group (Galinsky, 2002). However, identification of key individuals, such as brokers, within networks can be a challenging task, which requires social intelligence and a good understanding of the social dynamics.

## 6. Future directions and limitations

The limitations of the present study provide pointers for future research. First, our cross-sectional data do not allow a causal direction to be established. We cannot discern for certain whether low performance could have been at the root of negative perceptions, instead of a reversed causality postulated above. Thus, future studies should include longitudinal research designs that capture the directionality between variables and examine the dynamic nature of networks over an extended period of time (i.e. co-evolution of network structure and affective states in formation of negative ties, conflict, and social liabilities). Secondly, our hypothesis on increasing negative perceptions in increasingly closed groups (H1) was only partially supported, and our hypothesis on the role of reciprocity (H3) was not supported. These findings open avenues for future research. Our results may have been influenced by other unknown variables. Future studies should investigate different mechanisms and conditions underpinning negativity within networks. For example, competition over scarce resources and undesirable future prospects has been found to give rise to intergroup hostilities and biases (Galinsky, 2002). It would be an interesting avenue for future work to examine how these may mediate or moderate the network processes that underlie the formation of social capital and social liabilities. In general, more emphasis should be placed on the investigation of mechanisms and outcomes of intergroup bias in organizational studies; especially when bearing in mind increased use of teams, diverse work force, matrix structures and cross-functional designs, all of which require effective interpersonal and intergroup interactions in order to add value to organizational activities. Finally, whilst we provide a critical step in evaluating the effects of negative perceptions on organizational performance, our performance construct was limited in that it was based on a single-item scale. Performance is a multidimensional concept (Franco-Santos et al., 2007; Neely et al., 2005), and future studies should take this into consideration when drawing connections between performance and network interactions.

## 7. Conclusions

While social capital is a key concept for success in specific organizational contexts (Adler and Kwon, 2002; Field, 2008), the conditions under which it may induce negative outcomes has received insufficient attention in the extant literature – especially from an empirical viewpoint of global virtual teams. By combining insights from social identity theory and organizational network theory we offer a rich picture of the conditions under which social capital can induce negative outcomes. We demonstrated that the structural configuration of social capital has important implications for the sociocognitive processes that cause individuals to adopt increasingly negative attitudes towards out-group members. Network density (in social capital as well as in negative ties) significantly contributed towards this outcome. Furthermore, brokers and central actors within identity groups also had negative attitudes towards out-group. These negative perceptions in global virtual teams resulted in poor performance evaluations from other network participants. In contrast, social capital significantly improved perceived performance. Overall, our study contributes towards a better understanding of the sociopsychological aspects behind well-established network mechanisms and social capital in global virtual teams. It evaluates the positive and negative implications of structural configurations on out-group perceptions, which we argue are important precursors to successful intergroup interactions in global virtual teams.

## References

Abelson, R.P., Aronson, E., McGuire, W.J., Newcomb, T.M., Rosenberg, M.J., Tannenbaum, P.H., 1968. Theories of Cognitive Consistency: A Sourcebook. Rand McNally, Chicago.

Adler, P.S., Kwon, S.-W., 2002. Social capital: prospects for a new concept. Acad. Manag. Rev. 27, 17–40.

Ashforth, B.E., Mael, F., 1989. Social identity theory and the organization. Acad. Manag. Rev. 14, 20–39.

Barsade, S.G., 2002. The ripple effect: emotional contagion and its influence on group behavior. Adm. Sci. Q. 47, 644–675.

Barsade, S.G., Ramarajan, L., Westen, D., 2009. Implicit affect in organizations. Res. Organ. Behav. 29, 135–162.

Bonacich, P., 1987. Power and centrality: a family of measures. Am. J. Sociol. 92, 1170–1182.

Borgatti, S.P., Cross, R., 2003. A relational view of information seeking and learning in social networks. Manag. Sci. 49, 432–445.

Borgatti, S.P., Halgin, D.S., 2011. On network theory. Organ. Sci. 22, 1168–1181.

Brass, D.J., 1992. Power in organizations: a social network perspective. In: Moore, G., Whitt, J.A. (Eds.), Research in Politics and Society. JAI Press, Greenwich, CT, pp. 295–323.

Brass, D.J., Krackhardt, D., 1999. Social capital for twenty-first century leaders. In: Hunt, J.G., Phillips, R.L. (Eds.), Out-of-the-Box Leadership Challenges for the 21st

Century Army, pp. 179–194 (Emerald).

Brass, D.J., Butterfield, K.D., Skaggs, B.C., 1998. Relationships and unethical behavior: a social network perspective. Acad. Manag. Rev. 23, 14–31.

Breiger, R.L., Boorman, S.A., Arabie, P., 1975. An algorithm for clustering relational data with applications to social network analysis and comparison with multi-dimensional scaling. J. Math. Psychol. 12, 328–383.

Brown, R., 2000. Social identity theory: past achievements, current problems and future challenges. Eur. J. Soc. Psychol. 30, 745–778.

Burt, R.S., 1987. Social contagion and innovation: cohesion versus structural equivalence. Am. J. Sociol. 92, 1287–1335.

Burt, R.S., 1992. Structural Holes: The Social Structure of Competition. Harvard University Press, Cambridge, MA.

Burt, R.S., 1997. The Contingent Value of Social Capital. Adm. Sci. Q. 42, 339–365.

Burt, R.S., 2000. The Networks Structure of Social Capital. In: Staw, B.M., Sutton, R.I. (Eds.), Research in Organizational Behavior. JAI Press, Greenwich, CT.

Cameron, A.-F., Webster, J., 2011. Relational outcomes of multicommunicating: integrating incivility and social exchange perspectives. Organ. Sci. 22, 754–771.

Carton, A.M., Cummings, J.N., 2012. A theory of subgroups in work teams. Acad. Manag. Rev. 37, 441–470.

Chattopadhyay, P., Tluchowska, M., George, E., 2004. Identifying the ingroup: a closer look at the influence of demographic dissimilarity on employee social identity. Acad. Manag. Rev. 29, 180–202.

Clear, T., MacDonell, S.G., 2011. Understanding technology use in global virtual teams: research methodologies and methods. Inf. Softw. Technol. 53, 994–1011.

Coleman, J.S., 1988. Social capital in the creation of human capital. Am. J. Sociol. 94, S95–S120.

Coleman, J.S., 1990. Foundations of Social Theory. Harvard University Press, Cambridge.

Crisp, C.B., Jarvenpaa, S.L., 2013. Swift trust in global virtual teams. J. Pers. Psychol. 12, 45–56.

Cropanzano, R., Mitchell, M.S., 2005. Social exchange theory: an interdisciplinary review. J. Manag. 31, 874–900.

Daim, T.U., Ha, A., Reutiman, S., Hughes, B., Pathak, U., Bynum, W., Bhatla, A., 2012. Exploring the communication breakdown in global virtual teams. Int. J. Proj. Manag. 30, 199–212.

Das, T.K., Teng, B.-S., 2000. A resource-based theory of strategic alliances. J. Manag. 26, 31–61.

Dekker, D., Krackhardt, D., Snijders, T.A.B., 2005. Sensitivity of MRQAP tests to collinearity and autocorrelation conditions. In: The Heinz School Working Paper Series, (Pittsburgh, PA).

Dovidio, J.F., Gaertner, S.L., Validzic, A., 1998. Intergroup bias: status, differentiation, and a common in-group identity. J. Pers. Soc. Psychol. 75, 109–120.

Eisenberger, R., Lynch, P., Aselage, J., Rohdieck, S., 2004. Who takes the most revenge? Individual differences in negative reciprocity norm endorsement. Personal. Soc. Psychol. Bull. 30, 787–799.

Field, J., 2008. Social Capital, second ed. Routledge.

Fiol, C.M., O'Connor, E.J., 2005. Identification in face-to-face, hybrid, and pure virtual teams: untangling the contradictions. Organ. Sci. 16, 19–32.

Franco-Santos, M., Kennerley, M., Micheli, P., Martinez, V., Mason, S., Marr, B., Gray, D., Neely, A., 2007. Towards a definition of a business performance measurement system. Int. J. Oper. Prod. Manag. 27, 784–801.

Freeman, L.C., 1977. A set of measures of centrality based on betweenness. Sociometry 40, 35–41.

Freeman, L.C., Roeder, D., Mulholland, R.R., 1979. Centrality in social networks: II. experimental results. Soc. Networks 2, 119–141.

Freeman, L.C., Romney, A.K., Freeman, S.C., 1987. Cognitive structure and informant accuracy. Am. Anthropol. 89, 310–325.

Friedman, R.A., Podolny, J., 1992. Differentiation of boundary spanning roles: labor negotiations and implications for role conflict. Adm. Sci. Q. 37, 28–47.

Fu, Y., 2005. Measuring personal networks with daily contacts: a single-item survey question and the contact diary. Soc. Networks 27, 169–186.

Gaertner, L., Insko, C.A., 2000. Intergroup discrimination in the minimal group paradigm: categorization, reciprocation, or fear? J. Pers. Soc. Psychol. 79, 77–94.

Galinsky, A.D., 2002. Creating and reducing intergroup conflict: the role of perspective-taking in affecting out-group. In: Sondak, H., Neale, M.A., Mannix, E. (Eds.), Toward Phenomenology of Groups and Group Membership. JAI Press Inc..

Gibson, C.B., Gibbs, J.L., 2006. Unpacking the concept of virtuality: the effects of geographic dispersion, electronic dependence, dynamic structure, and national diversity on team innovation. Adm. Sci. Q. 51, 451–495.

Gould, R.V., Fernandez, R.M., 1989. Structures of mediation: a formal approach to brokerage in transaction networks. Sociol. Methodol. 19, 89–126.

Gouldner, A.W., 1960. The norm of reciprocity: a preliminary statement. Am. Sociol. Rev. 25, 161–178.

Granovetter, M.S., 1973. The strength of weak ties. Am. J. Sociol. 78, 1360–1380.

Granovetter, M., 1985. Economic action and social structure: the problem of embeddedness. Am. J. Sociol. 91, 481–510.

Haas, M.R., Cummings, J.N., 2015. Barriers to knowledge seeking within MNC teams: which differences matter most? J. Int. Bus. Stud. 46, 36–62.

Hanneman, R.A., Riddle, M., 2005. Introduction to Social Network Methods. University of California, Riverside, CA.

Heider, F., 2013. The Psychology of Interpersonal Relations. Psychology Press.

Hewstone, M., Rubin, M., Willis, H., 2002. Intergroup bias. Annu. Rev. Psychol. 53, 575–604.

Hinds, P.J., Bailey, D.E., 2003. Out of sight, out of sync: understanding conflict in distributed teams. Organ. Sci. 14, 615–632.

Hinds, P.J., Mortensen, M., 2005. Understanding conflict in geographically distributed teams: the moderating effects of shared identity, shared context, and spontaneous communication. Organ. Sci. 16, 290–307.

Hogg, M.A., Terry, D.J., 2000. Social identity and self-categorization processes in organizational Contexts. Acad. Manag. Rev. 25, 121–140.

Hogg, M.A., Turner, J.C., 1985. Interpersonal attraction, social identification and psychological group formation. Eur. J. Soc. Psychol. 15, 51–66.

Homans, G.C., 1958. Social behavior as exchange. Am. J. Sociol. 63, 597–606.

Horwitz, M., Rabbie, J.M., 1982. Individuality and mem-bership in the intergroup system. In: Tajfel, H. (Ed.), Social Identity and Intergroup Relations. Cambridge University Press, Cambridge.

Huitsing, G., van Duijn, M.A.J., Snijders, T.A.B., Wang, P., Sainio, M., Salmivalli, C., Veenstra, R., 2012. Univariate and multivariate models of positive and negative networks: liking, disliking, and bully–victim relationships. Soc. Networks 34, 645–657.

Inkpen, A.C., Tsang, E.W.K., 2005. Social capital, networks, and knowledge transfer. Acad. Manag. Rev. 30, 146–165.

Jehn, K.A., 1995. A multimethod examination of the benefits and detriments of intragroup conflict. Adm. Sci. Q. 40, 256–282.

Kadushin, C., 1995. Friendship among the French financial elite. Am. Sociol. Rev. 60, 202–221.

Keeley, B., 2007. Human Capital. OECD Publishing.

Kilduff, M., Krackhardt, D., 2008. Interpersonal Networks in Organizations: Cognition, Personality, Dynamics, and Culture. Cambridge University Press.

Klitmøller, A., Lauring, J., 2013. When global virtual teams share knowledge: media richness, cultural difference and language commonality. J. World Bus. 48, 398–406.

Kogut, B., Zander, U., 1992. Knowledge of the firm, combinative capabilities, and the replication of technology. Organ. Sci. 3, 383–397.

Kogut, B., Zander, U., 1993. Knowledge of the firm and the evolutionary theory of the multinational corporation. J. Int. Bus. Stud. 24, 625–645.

Kossinets, G., 2006. Effects of missing data in social networks. Soc. Networks 28, 247–268.

Krackhardt, D., 1987. QAP partialling as a test of spuriousness. Soc. Networks 9, 171–186.

Krackhardt, D., Stern, R.N., 1988. Informal networks and organizational crises: an experimental simulation. Soc. Psychol. Q. 123–140.

Labianca, G., Brass, D.J., 2006. Exploring the social ledger: negative relationships and negative asymmetry in social networks in organizations. Acad. Manag. Rev. 31, 596–614.

Labianca, G., Brass, D.J., Gray, B., 1998. Social networks and perceptions of intergroup conflict: the role of negative relationships and third parties. Acad. Manag. J. 41, 55–67.

Labianca, G., Fairbank, J.F., Thomas, J.B., Gioia, D.A., Umphress, E.E., 2001. Emulation in academia: balancing structure and identity. Organ. Sci. 12, 312–330.

Leana, C.R., Van Buren, H.J., 1999. Organizational social capital and employment practices. Acad. Manag. Rev. 24, 538–555.

Leonard, A.S., Mehra, A., Katerberg, R., 2008. The social identity and social networks of ethnic minority groups in organizations: a crucial test of distinctiveness theory. J. Organ. Behav. 29, 573–589.

Lin, N., 2002. Social Capital: A Theory of Social Structure and Action. Cambridge University Press, Cambridge.

Magnusson, P., Schuster, A., Taras, V., 2014. A process-based explanation of the psychic distance paradox: evidence from global virtual teams. Manag. Int. Rev. 54,

283–306.

Marsden, P.V., 1990. Network data and measurement. Annu. Rev. Sociol. 435–463.

Maurer, I., Ebers, M., 2006. Dynamics of social capital and their performance implications: lessons from biotechnology start-ups. Adm. Sci. Q. 51, 262–292.

McCarty, C., Bernard, H.R., Killworth, P.D., Shelley, G.A., Johnsen, E.C., 1997. Eliciting representative samples of personal networks. Soc. Networks 19, 303–323.

McPherson, J.M., Smith-Lovin, L., 1987. Homophily in voluntary organizations: status distance and the composition of face-to-face groups. Am. Sociol. Rev. 52, 370–379.

Mehra, A., Kilduff, M., Brass, D.J., 1998. At the margins: a distinctiveness approach to the social identity and social networks of underrepresented groups. Acad. Manag. J. 41, 441–452.

Mummendey, A., Simon, B., Dietze, C., Grünert, M., Haeger, G., Kessler, S., Lettgen, S., Schäferhoff, S., 1992. Categorization is not enough: intergroup discrimination in negative outcome allocation. J. Exp. Soc. Psychol. 28, 125–144.

Nahapiet, J., Ghoshal, S., 1998. Social capital, intellectual capital, and the organizational advantage. Acad. Manag. Rev. 23, 242–266.

Neely, A., Gregory, M., Platts, K., 2005. Performance measurement system design: a literature review and research agenda. Int. J. Oper. Prod. Manag. 25, 1228–1263.

Nelson, R.E., 1989. The strength of strong ties: social networks and intergroup conflict in organizations. Acad. Manag. J. 32, 377–401.

Newcomb, T.M., 1961. The Acquaintance Process. Holt, Rinehart & Winston, New York.

Newell, S., Tansley, C., Huang, J., 2004. Social capital and knowledge integration in an ERP project team: the importance of bridging and bonding. Br. J. Manag. 15, S43–S57.

Nohria, N., Ghoshal, S., 1997. The Differentiated Network: Organizing Multinational Corporations for Value Creation. Jossey-Bass, San Francisco.

Oh, H., Labianca, G., Chung, M.-H., 2006. A multilevel model of group social capital. Acad. Manag. Rev. 31, 569–582.

Parkhe, A., 1993. Strategic alliance structuring: a game theoretic and transaction cost examination of interfirm cooperation. Acad. Manag. J. 36, 794–829.

Peltokorpi, V., Vaara, E., 2014. Knowledge transfer in multinational corporations: productive and counterproductive effects of language-sensitive recruitment. J. Int. Bus. Stud. 45, 600–622.

Pinjani, P., Palvia, P., 2013. Trust and knowledge sharing in diverse global virtual teams. Inf. Manag. 50, 144–153.

Portes, A., Landolt, P., 1996. The downside of social capital. Am. Prospect. 7, 18–21.

Portes, A., Sensenbrenner, J., 1993. Embeddedness and immigration: notes on the social determinants of economic action. Am. J. Sociol. 98, 1320–1350.

Rabbie, J.M., Schot, J.C., Visser, L., 1989. Social identity theory: a conceptual and empirical critique from the perspective of a behavioural interaction model. Eur. J. Soc. Psychol. 19, 171–202.

Raush, H.L., 1965. Interaction sequences. J. Pers. Soc. Psychol. 2, 487–499.

Rozin, P., Royzman, E.B., 2001. Negativity bias, negativity dominance, and contagion. Personal. Soc. Psychol. Rev. 5, 296–320.

Sachdev, I., Bourhis, R.Y., 1991. Power and status differentials in minority and majority group relations. Eur. J. Soc. Psychol. 21, 1–24.

Saunders, C., Van Slyke, C., Vogel, D.R., 2004. My time or yours? Managing time visions in global virtual teams. Acad. Manag. Exec. 18, 19–37.

Schoenewolf, G., 1990. Emotional contagion: Behavioral induction in individuals and groups. Mod. Psychoanal. 15, 49–61.

Schulte, M., Cohen, N.A., Klein, K.J., 2012. The coevolution of network ties and perceptions of team psychological safety. Organ. Sci. 23, 564–581.

Shah, J.Y., Kruglanski, A.W., Thompson, E.P., 1998. Membership has its (epistemic) rewards: need for closure effects on in-group bias. J. Pers. Soc. Psychol. 75, 383.

Simmel, G., Wolff, K.H., 1950. The Sociology of Georg Simmel. Simon and Schuster.

Sparrowe, R.T., Liden, R.C., Wayne, S.J., Kraimer, M.L., 2001. Social networks and the performance of individuals and groups. Acad. Manag. J. 44, 316–325.

Stahl, G., Maznevski, M.L., Voigt, A., Jonsen, K., 2010. Unraveling the effects of cultural diversity in teams: a meta-analysis of research on multicultural work groups. J. Int. Bus. Stud. 41, 690–709.

Struch, N., Schwartz, S.H., 1989. Intergroup aggression: its predictors and distinctness from in-group bias. J. Pers. Soc. Psychol. 56, 364–373.

Tajfel, H.E., 1978. Differentiation Between Social Groups: Studies in the Social Psychology of Intergroup Relations. Academic Press.

Tajfel, H., Turner, J.C., 1979. An integrative theory intergroup conflict. In: Austin, W.G., Worchel, S. (Eds.), The Social Psychology of Intergroup Relations. Brooks/Cole, Monterey, CA, pp. 33–48.

Tajfel, H., Turner, J.C., 1985. Social identity theory of intergroup behavior. In: Worchel, A., Austin, W.G. (Eds.), Psychology of Intergroup Relations, 2 ed. Nelson-Hall, Chicago, pp. 7–24.

Tajfel, H., Billig, M.G., Bundy, R.P., Flament, C., 1971. Social categorization and intergroup behaviour. Eur. J. Soc. Psychol. 1, 149–178.

Tsai, W., Ghoshal, S., 1998. Social capital and value creation: the role of intrafirm networks. Acad. Manag. J. 41, 464–476.

Tsui, A.S., Egan, T.D., O'Reilly III, C.A., 1992. Being different: relational demography and organizational attachment. Adm. Sci. Q. 37, 549–579.

Verbeke, W., Bagozzi, R.P., 2000. Sales call anxiety: exploring what it means when fear rules a sales encounter. J. Mark. 64, 88–101.

Villena, V.H., Revilla, E., Choi, T.Y., 2011. The dark side of buyer–supplier relationships: a social capital perspective. J. Oper. Manag. 29, 561–576.

Wasserman, S., Faust, K., 1994. Social Network Analysis: Methods and Applications. Cambridge University Press.

Xiao, Z., Tsui, A.S., 2007. When brokers may not work: the cultural contingency of social capital in Chinese high-tech firms. Adm. Sci. Q. 52, 1–31.

Zaheer, A., Gözübüyük, R., Milanov, H., 2010. It's the connections: the network perspective in interorganizational research. Acad. Manag. Perspect. 24, 62–77.

Zahra, S.A., Sapienza, H.J., Davidsson, P., 2006. Entrepreneurship and dynamic capabilities: a review, model and research agenda. J. Manag. Stud. 43, 917–955.

Zimmermann, A., 2011. Interpersonal relationships in transnational, virtual teams: towards a configurational perspective. Int. J. Manag. Rev. 13, 59–78.