



## Group interaction styles in a virtual context: The effects on group outcomes<sup>☆</sup>

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### ARTICLE INFO

#### Article history:

Available online 11 June 2010

#### Keywords:

Group interaction styles  
Virtual teams  
Group outcomes  
Communication media  
Performance  
Longitudinal study

### ABSTRACT

The influence of communication and information technologies (TICs) on group functioning and group outcomes is an important topic. Interdependent group work implies the need to communicate in order to share information and knowledge related to the task. The importance of this group interaction in the group functioning and outcomes stands out. In this sense, a line of investigation has arisen to study the role of interaction styles in the relationship between communication technology and group outcomes, as some functional or dysfunctional outputs depend on group interaction styles. From this perspective, the objective of this study is twofold: (1) to analyze the group interaction styles in virtual teams over time, and (2) to analyze whether the group virtuality level moderates the relationships between group interaction style and group outcomes over time. Data was collected from a laboratory study in which 44 groups of four members participated. Groups were randomly assigned to communication contexts with different virtuality levels. The results obtained have shown a differential role of group interaction style according to the group virtuality level. Virtuality level plays a moderate role in the relationships between passive group interaction style and objective and subjective outcomes and between constructive interaction style and subjective outcomes.

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### 1. Introduction

Nowadays, virtual teams are an essential element in achieving organizational excellence. In this sense, virtual teams are becoming a common strategic work unit in many organizations, as a way to deal with their dynamic environments.

Virtual teams are teams whose members are separated or geographically dispersed, and they use predominantly electronic information and communication technology as a medium for facilitating coordination and communication to perform team tasks (Bell & Kozlowski, 2002; Gibson & Cohen, 2003; Hertel, Geister, & Konradt, 2005; Maruping & Agarwal, 2004). These teams can work using a broad array of technologies that differ in the extent of their media richness as communication channels (Daft & Lengel, 1984) and in the extent to which they enable synchronous collaboration (Maruping & Agarwal, 2004). Thus, the different technologies can vary in their levels of complexity according to the possibilities they offer (i.e. audio, text, and image), and *the virtuality* can be understood as a continuum, depending on the degree of electronic dependence or geographical dispersion (Gibson & Cohen, 2003). In this way, whereas some media are higher in media richness

and synchronicity, such as videoconference, other media (e.g. e-mail) are lower in these dimensions (Martins, Gilson, & Maynard, 2004).

Since organizations look for benefits from introducing virtual team work, good communication seems desirable (Anderson, McEwan, & Carletta, 2007). In this context, numerous studies have explored the impact of communication technology on group processes and results (e.g. Cramton, 2002; Hinds & Bailey, 2003; Hollingshead, 1996; Hollingshead, Mc Grath & O'Connor, 1993; Ripoll, González-Navarro, Zornoza, Orengo, & y Peiró, 2004; Zornoza, Orengo, Gosálvez, & y González, 2002). The communication medium studied most often is computer communication (CMC) because it restricts many contextual and social cues (Culnan & Markus, 1987; Daft & Lengel, 1984, 1986; Short, Williams, & Christie, 1976). However, the emergent use of videoconference in organizations (VC), as it permits higher social presence and communication cues (Whittaker, 2003), makes it interesting and useful to study this communication medium as well. Nevertheless, there have been few studies on technologies that support spoken interactions, such as videoconference (Anderson et al., 2007).

In our study, groups worked through VC or using synchronous CMC. Therefore, our measure of virtuality level focuses on the characteristics of the technology used by the team, as they are relevant to describe and understand the dynamic of the virtual team environment (Chudoba, Wynn, Lu, & Watson-Manheim, 2005). These two conditions differ on the next technological characteristics: (1) Group members are physically isolated (but not geographically

<sup>☆</sup> The authors are grateful for the financial support of the Spanish Agency of Education and Science (SEJ2005-05375, ACOMP07-304, within the CONSOLIDER Project SEJ2006-14086).

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dispersed). Nevertheless, VC could increase the sense of both physical and psychological distance compared to CMC; (2) both are electronically dependent (each group uses either instant messaging only or only videoconference), and (3) the amount of informational value provided by the technology is different in each virtuality level studied. In VC teams, the members can see and listen to each other, and in CMC teams, the members can use written information only.

Interdependent work entails the necessity to communicate continuously in order to share information and knowledge related to the task (Rasker, Post, & Schraagen, 2000). The importance of this group interaction in group functioning and outcomes stands out. In this sense, a line of investigation has arisen to study the role of interaction styles in the relationship between communication technology and group outcomes (Balthazard, Potter, & Warren, 2004; Potter & Balthazard, 2004; Potter, Cooke, & Balthazard, 2000).

In this context, the aim of this study is twofold: first, to analyze the group interaction styles in virtual teams over time, and second, to study the role of the virtuality level in the relationship between group interaction styles and group outcomes (subjective and objective performance). To reach our objectives, we have carried out experimental research with 44 groups composed of four members each. These groups had to create a human resources company during four work group sessions. Thus, our design is longitudinal. Two experimental conditions were created: computer-mediated communication (CMC) and videoconference (VC).

### 1.1. Group interaction styles in virtual teams

It is well known that one of the most important functions of the team consists of the way group members interact with each other. In fact, from the first studies carried out on the small group, the importance of the group interaction in the functioning and effectiveness of the groups was evident. Therefore, most theoretical models share the idea that team effectiveness is explained not only by the final result obtained by the group, but also by the process followed to arrive at the result (Hackman, 1987; Hackman & Morris, 1975; Sundstrom, De Meuse and Furell, 1990; Guzzo, Yost, Campbell, & Shea, 1993).

Group processes are behavior and communication patterns that emerge between members of the group to transform inputs into outputs (McGrath, 1984). Their use defines and creates group interaction styles. These styles acquire great importance, as they are “the ways in which members interact with one another and approach the task to be accomplished”, and they include aspects of task and group maintenance that can facilitate or inhibit group outcomes (Cooke & Lafferty, 1988, p. 1). Group interaction styles (GIS) favor the development of multiple important roles and activities for the optimal functioning of the work team: capacity to influence, interpersonal actions, conflict management, exchange of information, facilitating or inhibiting group effectiveness, etc.

Cooke and Szumal (1994) developed a group styles typology, subsequently used in the virtual context by Potter and Balthazard (2002a, 2002b), to capture the dimensions of behavior that are important in group problem-solving outcomes. They differentiate between three separate yet interrelated group interaction styles: constructive, aggressive and passive styles. The *Constructive style* consists of offering cooperative, integrative and mutual support among members of the group. It combines task and socio-emotional aspects. The *Aggressive style* refers to a competitive, imperative, persuasive and directive mode between group members. It is characterized by an emphasis on task-related behaviors. Finally, the *passive style* consists of showing a conformist, impartial and dependent style. In this case, an emphasis on aspects of group maintenance can be observed.

In accordance with recent research, GIS development can be different depending on the communication context in which they are used. The literature reviewed reveals different explanations for this situation. The early theories about CMC effects, called the “cues-filtered-out approaches” (Culnan & Markus, 1987), suggested that CMC led to impersonal communication due to limited bandwidth (Gibson & Cohen, 2003; McGrath & Hollingshead, 1993; Siegel, Dubrovsky, Kiesler, & McGuire, 1986). In this way, the objective characteristics of the technology used determine the group functioning. The lack of non-verbal and social cues and reduced social presence hinder the transmission of necessary information during group interactions. Thus, the functioning and results of the group depend on the technology itself.

In this line, recent studies carried out by Potter and Balthazard (2002a, 2002b) suggest that group interaction styles appear to be dependent, at least in part, on the communication context. The results obtained by these studies confirm that CMC teams develop a more passive interaction style and less constructive and aggressive styles than face to face teams (FTF). However, CMC groups have also been found to be more focused on task aspects (Hollingshead, 1996; Simons & Peterson, 2000), which would seem more characteristic of aggressive interaction styles. Tidwell and Walther (2002) found that CMC and FTF groups interact in different ways. CMC teams used a greater proportion of direct and interactive strategies (questions and self-disclosures) than the FTF groups. On the contrary, the FTF groups’ interaction displayed a greater proportion of conversation elements (statements of fact that were not personal in nature, statements about third parties, exclamations, imperatives...). As Tidwell and Walther (2002) suggest, these strategies are probably more difficult to deploy in CMC than in FTF because certain necessary resources might be less available online. Hinds and Bailey (2003) also point out that collaboration strategies are more difficult in CMC than in conventional groups. In this way, different authors (Hiltz, Johnson, & Turoff, 1986; Lira, Ripoll, Peiró, & González, 2007; Orengo, Zornoza, Prieto, & y Peiró, 2000; Siegel et al., 1986; Zornoza, Ripoll, & Peiró, 2002) have also found that the CMC medium presents more expression and communication difficulties (e.g. uninhibited behavior, negative conflict management) than FTF does.

These studies compare computer-mediated communication groups with FTF groups. Nevertheless, the growing use of videoconference in organizations (Whittaker, 2003) also makes it interesting and useful to analyze group interaction styles in VC groups and find out whether there are significant differences in group interaction styles between CMC and VC teams. Moreover, VC is richer than the CMC medium from a normative perspective, as it can convey both verbal and non-verbal cues. CMC communication is the poorest medium, as it eliminates all visual and verbal cues from the sender and displays only text-based symbols to convey information (Mennecke, Valacich, & Wheeler, 2000).

On the other hand, most of the studies related to this first research stream have used a cross-sectional design. However, over time and with practice using the medium, virtual team members can develop shared knowledge and a common system of understanding (Likoebe & Ritu, 2004). In accordance with *Social Information Processing Theory* (SIP), the critical difference between communication media is a question of rate, not capability (Walther, Anderson, & Park, 1994). Users can adapt to the technology through the development of new strategies to carry out the task and to manage the interaction behaviors among team members.

In virtual team context research, Potter and Balthazard (2002a) have also emphasized the need to carry out longitudinal studies in order to get a better understanding of group dynamics and GIS development over time.

However, little is known about the role of time in GIS development for work teams. Although CMC groups can develop a more

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