

Procedural Justice and Identification with Virtual Teams: The Moderating Role of Face-to-Face Meetings and Geographical Dispersion

Marko Hakonen · Jukka Lipponen

Published online: 13 June 2008
© Springer Science+Business Media, LLC 2008

Abstract We investigated the previously unstudied relationship between procedural justice and identification within virtual teams, with a particular focus on how two features of virtual teams, namely frequency of face-to-face meetings and geographical dispersion, moderate that relationship. We argue that these two variables are sources of uncertainty, which in turn makes virtual team members more sensitive to perceptions of procedural fairness as essential cues in the identification process. In this study, we used cross-sectional survey methodology and data aggregated to the team level ($N = 39$). As predicted, our results showed that the link between procedural justice and identification was stronger when there were few face-to-face meetings and when teams were highly dispersed.

Keywords Virtual teams · Procedural justice · Identification · Uncertainty

Introduction

During the past 15 years, globalization, the need for flexibility, and opportunities provided by information and communication technology (ICT) have paved the way for the proliferation of new organizational forms, such as virtual teams (VTs) (e.g., Lipnack & Stamps, 2000). A VT is often described as a group of people striving toward a common goal, dispersed in many locations, and communicating with each other predominantly via ICT (e.g., Axtell, Fleck, & Turner, 2004; see below for a detailed discussion about VT definitions). Despite the growing number of

M. Hakonen (✉) · J. Lipponen
Laboratory of Work Psychology and Leadership, Helsinki University of Technology,
P.O. Box 5500, TKK 02015, Finland
e-mail: marko.hakonen@tkk.fi

J. Lipponen
Department of Social Psychology, University of Helsinki, Helsinki, Finland

practitioner-oriented (e.g., Duarte & Snyder, 2006) and academic studies (e.g., Maznevski & Chudoba, 2000) of VTs, empirical studies of real-life VTs are still rather rare (Martins, Gilson, & Maynard, 2004).

Procedural justice refers to the perceived fairness of decision-making procedures (Leventhal, 1980). After many years of research, it is now acknowledged that employees' perceptions of procedural justice are critical factors influencing various important work outcomes, such as organizational identification (e.g., Blader & Tyler, 2005; Olkkonen & Lipponen, 2006; Tyler & Blader, 2000), defined as "the perception of oneness with or belonging to a group" (Ashforth & Mael, 1989, p. 34). Many authors writing on VTs, in turn, have pointed out that identification with the VT is crucial for its success because identification has been proposed to provide a sense of belonging despite the relative lack of face-to-face interaction in the virtual context (see Gibson & Cohen, 2003; Hinds & Kiesler, 2002). Yet, there are only a few studies on identification with VTs (Fiol & O'Connor, 2005), and this has been suggested to be a prominent theme in future research (Powell, Piccoli, & Ives, 2004). Moreover, there has been only one study on fairness in virtual settings (Kurland & Egan, 1999), and none at all on the relationship between fairness and identification in VTs. Our aim in the present paper is to start to fill the gaps outlined above.

Our study focuses on how procedural justice is related to identification in VTs. First, we take a glance at the VT literature and the ongoing debate concerning the definition of VT. Second, we summarize those studies that are most relevant to an understanding of fairness and identification processes in virtual settings. Third, we take a glance at the literature on organizational justice in order to elaborate on the theoretical explanation of the relationship between procedural justice and identification. Finally, we develop the argument about how and why such features of VTs as lack of face-to-face interaction and geographical dispersion may moderate the justice-identification relationship.

Virtual Teams and Virtuality

One of the basic debates in the literature concerns the proper definitions of the VT and virtuality (Gibson & Gibbs, 2006). According to recent reviews (Hertel, Geister, & Konradt, 2005; Martins et al., 2004), it is a common notion that virtuality is a matter of degree. Indeed, there are more and less VTs, and we also share the view that virtuality should be seen as a continuum rather than as an absolute state. To make the situation even more complex, different authors name different attributes of VTs as definitional (Martins et al., 2004). It seems rather clear that for a VT to be a team it should consist of more than one person collaborating to achieve a common goal (e.g., Hertel et al., 2005). Most authors propose (e.g., Bosch-Sijtsema, 2003; Hertel et al., 2005; Maznevski & Chudoba, 2000) that for a team to be virtual at least one of its members must work in a different location from the others. This is a minimal condition for geographical dispersion. Moreover, very often VTs are characterized by the fact that members communicate with each other mainly through information and communication technology (ICT; Axtell et al., 2004; Gibson & Gibbs, 2006). This can be put in another way: lack of face-to-face

meetings is a typical feature of VTs. The latter characterization makes a better distinction between (fully) co-located and VTs than the former because some empirical evidence suggests (e.g., Griffith & Neale, 2001) that co-located teams may use as much or even more ICT in their communication than members of VTs. Many authors also include other features, such as crossing temporal, cultural, and organizational boundaries, in their definitions of VTs and their virtuality (see Gibson & Gibbs, 2006, for review). We do not, however, take a stance in the ongoing debate of what features or attributes of VTs are definitional or what constitutes the core of virtuality. We simply study the effects of two, obviously rather elementary (Axtell et al., 2004), features of VTs: the frequency of face-to-face meetings of the members and the amount of geographical dispersion of the team or its sub-groups in different locations.

Studies on Justice and Identification in Virtual Settings

Previous studies on VTs have largely neglected the role of procedural justice. To our knowledge, only Kurland and Egan (1999) have studied fairness in virtual settings. Their pioneering work investigated how telecommuting and structural factors of the organization such as outcome-based performance evaluation, formality of communication, and job formalization were related to the justice perceptions of telecommuters. Among other things, they found that telecommuting and informal communication was positively related to procedural justice. They suggest that these results were partly attributable to active supervisory communication and decision justification, especially via e-mail. Telecommuting and telework are synonyms referring to a flexible, individual work arrangement in which employees spend some of their working time outside their conventional workplace (e.g., at home; Nilles, 1994). Telework, unlike VTs, does not presuppose teamwork toward a common goal. Thus, Kurland and Egan's (1999) study might not fully inform us about the potentially special group-level dynamics of virtual teamwork. Furthermore, since they neither measured identification nor studied the consequences of justice, their study does not shed light on the justice-identification link, the focus of our study.

Existing empirical research is not necessarily informative about whether or not there is something special in identification with VTs (Fiol & O'Connor, 2005). Despite the rather common claim that it is more difficult to identify with a VT than with a co-located team (e.g., Mannix, Griffith, & Neale, 2002), Mortensen and Hinds (2001) found no difference between the levels of identification of virtual and co-located team members. The low number of previous studies limits our knowledge about the interplay between different factors in the development of VT identification (Fiol & O'Connor, 2005). Moreover, the focus of previous studies has predominantly been limited to communication and communication technology. As Fiol and O'Connor (2005, p. 20) argue, "We know very little about the interrelationships among individual, group, and situational factors in the development of identification in VTs." Still, relevant research has been carried out. For instance, Wiesenfeld, Raghuram, and Garud (1999) found in a seminal study that

virtual workers built their identification on electronic communication to a greater extent than their less virtual counterparts. They also found that the frequency of face-to-face communication had no main effect on identification. Again, the potential problem here is that they studied teleworkers rather than VTs, and the results may thus not be generalizable to virtual teamwork.

Perceived Procedural Justice and Identification

Given the major consequences of perceived procedural justice found in previous studies (see Cohen-Charash & Spector, 2001; Colquitt, Greenberg, & Scott, 2005, for recent reviews), researchers have been trying to explain why people care about procedural justice. Following the lines of the group engagement model developed by Tyler and Blader (2003), we argue that justice perceptions should affect identification given the positive social-identity-relevant information that justice communicates to individuals. More specifically, justice communicates to individuals that they are respected members within their group, and that they can be proud of their group membership. Furthermore, through its link to these feelings of respect and pride, it should be further related to increased identification with the group (Tyler & Blader, 2003). This relationship develops because people are more highly motivated to merge their identity with a group when the group has high status (pride), and when they feel they have status in the group (respect). Pride and respect engender identification with the group in people's motivated attempts to develop and maintain a positive social identity (Tyler & Blader, 2003). On the basis of the group engagement model, it thus seems plausible that perceptions of justice should be positively associated with team identification. The empirical findings from co-located settings support the idea that there is a positive link between procedural justice and identification (Olkonen & Lipponen, 2006; Tyler & Blader, 2000, 2001).

However, as noted by Martins et al. (2004), for example, it would be unwise to assume that we would always find similar processes in co-located and VTs. Next, we will proceed to discuss how and why the two features of VTs, namely frequency of face-to-face meetings and geographical dispersion, could moderate the relationship between procedural justice and identification.

Uncertainty and Virtual Teams

According to the uncertainty management model (Van den Bos & Lind, 2002), people look for information about procedural justice to reduce uncertainty. Previous empirical research on this model has indeed revealed that perceived justice is especially important when people experience high levels of uncertainty (e.g., De Cremer & Sedikides, 2005; Van den Bos, Wilke, & Lind, 1998). This model, however, is relatively silent on the issue of which type of uncertainty is involved. That is, relevant research has manipulated different types of uncertainty (e.g., control, situational uncertainty, and fear of death) and, as such, it is not clear which one is more closely associated with responses to procedural information (De Cremer & Sedikides, 2005). Nevertheless, this basic argumentation of the uncertainty

management model (Van den Bos & Lind, 2002), combined with the central premises of the group engagement model (Tyler & Blader, 2000, 2003), could also be used to explain how the frequency of face-to-face meetings and geographical dispersion may moderate the relationship between procedural justice and identification with the VT.

As many authors point out, uncertainty and ambiguity are typical of VTs (e.g., Fiol & O'Connor, 2005; Kiesler & Cummings, 2002). Since in all VTs the members, or various subgroups, are dispersed and mainly interact via ICT, they have to rely on a limited number of cues about colleagues working at remote sites. Furthermore, these cues are often transmitted via ICT. We argue that, when VTs have low frequency of face-to-face meetings and/or when the VT is geographically highly dispersed, the uncertainty among the team members is higher than in VTs experiencing more direct face-to-face contacts and less dispersion.

Consequently, when uncertainty is high, VT members will rely more strongly on procedural fairness judgments as cues upon which to build their VT identity. In cases of more direct contacts and lower dispersion there should be other, more tangible cues that decrease the relative importance of perceived procedural fairness in the reduction of uncertainty. For instance, VT members have better chances of getting to know each other in traditional meetings, and they have fewer places to visit. In other words, insofar as low frequency of face-to-face meetings and/or high geographical dispersion can be seen as indicators of uncertainty, and perceived procedural justice as an important component in the identification construction process, it follows that the two features of VTs discussed above moderate the relationship between procedural justice and identification. Drawing on this argumentation we formulate two hypotheses as follows:

H1: The frequency of face-to-face meetings moderates the relationship between procedural justice and identification: the relationship is stronger when the frequency of face-to-face meetings is low than when it is high.

H2: The amount of geographical dispersion moderates the relationship between procedural justice and identification: the relationship is stronger when geographical dispersion is high than when it is low.

Method

Procedure and Respondents

The data for this study was gathered by means of a web-based questionnaire distributed to thirteen organizations during 2005, 2006, and 2007. The questionnaires were sent to the members of 39 VTs in 13 Finnish-based organizations, ranging from the social sector to the metal industry. Most of the data came from VTs in multinational companies (20 teams). All the VTs comprised specialists conducting non-routine tasks. The respondent teams were selected in collaboration with the contact person in each company, and with the agreement of the team leaders. The minimal conditions for selection were: (a) the teams had more than one

member collaborating to achieve a common goal, and (b) the team members or subgroups of them were located in different towns. In addition, we ensured that the respondents communicated mainly via ICT (i.e., not mainly face-to-face).

Consequently, 422 respondents received individual e-mails introducing the study and giving a web address through which they could confidentially complete the questionnaire. In the e-mail and in the questionnaire the respondents were reminded to answer all the questions with regard to their named VT. It was stressed that even though the term “team” was consistently used, they should think about the VT mentioned in the e-mail and on the questionnaire cover page while answering. A total of 293 acceptable questionnaires were returned, a response rate of 69.0%. A slight majority of the respondents were male (58.8%), with an average age of 39.3 years ($SD = 8.8$). Their average team tenure was 22.3 ($SD = 30.6$) months. The geographical distribution of the team members or their sub-groups ranged from two to 13 different towns ($M = 4.7$; $SD = 2.4$). More than two-thirds of our respondents spent more than half of their total working time in the particular VT they were asked about. VT membership was thus a relatively important part their working lives.

The mean size of teams was 10.5 employees ($SD = 7.3$). As group size has been found to be negatively related to both procedural justice (e.g., Colquitt, Noe, & Jackson, 2002) and group identification (e.g., Lipponen, Helkama, Olkkonen, & Juslin, 2005), we decided to control for size in our analyses.

Measures

Frequency of Face-to-Face Meetings

In line with Kirkman, Rosen, Tesluk, and Gibson (2004), information on the frequency of both formal face-to-face meetings (one item) and informal face-to-face meetings (one item) was requested in our questionnaire. The response scale for both items was: (1) never, (2) less than monthly, (3) monthly, (4) weekly, and (5) daily. Using these two items we created a measure of the frequency of face-to-face meetings. The two items correlated with each other ($r = .57$, $p < .001$), and the Cronbach's alpha was .70.

Geographical Dispersion

The geographical-dispersion figures were derived from information sheets provided to us by the team leaders. We simply counted the number of different locations (i.e., towns) in which the VT members or sub-groups of them worked. We used the objective location-dispersion figures of the whole team because they reflected the real geographical distribution better than the count of locations from the questionnaire responses. It was possible, for instance, that in a VT dispersed among seven locations only the members from three locations answered the questionnaire. Nevertheless, they were all affected by the factual structural feature of the team, i.e., by the total number of different locations (seven in the above example).

Perceived Procedural Justice

VT members' perceptions of procedural justice were measured by operationalizing the rules that, according to Leventhal (1980), people use when they judge the fairness of decision-making procedures. The scales developed by Moorman (1991) and Tyler and Blader (2000) were also used in developing the items. Our five items reflected the aspects of fair procedures suggested by Leventhal (1980): accuracy of information, correctability, bias-suppression, consistency, and representativeness in the decision-making process. Unlike in most previous studies, we deliberately did not focus solely on the decisions made by the team leader or supervisor (see Colquitt et al., 2002, for a discussion about team-level justice measures). Instead, we asked for fairness perceptions about all the decisions made in the team, and we did this for two reasons. Firstly, VTs are often described as 'lean' in terms of organizational form (e.g., Lipnack & Stamps, 2000). In other words, important decisions are probably also made by various team members and not only the leader. Secondly, because VTs are geographically distributed it may not always be clear who was the initial decision maker, although the decisions may have had a profound effect on the work of the VT members. In practice, the response focus on the team level was highlighted in that all the questions started with "When decisions are made in our team...." The five items after this focus-creating lead tapped the procedural aspects outlined above: "...they are based on accurate information"; "...they can be corrected afterwards if they are found to be poor"; "...everyone tries to suppress personal biases"; "...they are consistent over persons and over time"; and "...all those affected by the decision are heard." The items were answered on a five-point scale ranging from strongly disagree (1) to strongly agree (5). The Cronbach's alpha for the procedural justice measure was .77.

Identification

Identification with the VT was measured with a slightly modified version of the organizational identification scale developed by Mael and Ashforth (1992). One original item regarding public opinion was not used because teams seldom attract the same level of publicity as organizations. In addition, the questions were specifically targeted to assess team-level identification (not the whole organization; e.g., "When I talk about this *team*, I usually say 'we' rather than 'they'"). The response scale was the same as that for the justice items, and the Cronbach's alpha for this five-item scale was .82.

Aggregation to the Team Level

Because we were interested in the team-level measurement and used such clearly team-level constructs as objective geographical distribution and frequency of face-to-face meetings, we aggregated the data to the VT level. It could also be argued that in our study procedural justice should be treated as a team-level construct, because we specifically asked for perceptions of the whole VT. In line with the

recent psychological literature we used three different scores to assess the appropriateness of the aggregation of the individual-level measures to the team level. Firstly, we computed the r_{wg} statistics reflecting the inter-rater agreement and within-team consensus, as suggested by James, Demaree, and Wolf (1984). The mean r_{wg} scores for face-to-face communication were .61, for procedural justice .79, and for identification .81. Only the face-to-face communication failed to reach the conventionally acceptable level (.70). We also computed the ICC(1) statistics, i.e., the inter-rater reliability indices, and the ICC(2) values indicating the reliability of the group means (Chen & Bliese, 2002; Liao & Rupp, 2005). For our three individual-level measures, namely face-to-face meetings, procedural justice and identification, the ICC(1) values were .24, .25, and .04, and the ICC(2) values were .69, .71, and .26, respectively. The ICC(1) scores are acceptable when compared to many previous studies (e.g., Chen & Bliese, 2002; Simons & Robertson, 2003), although they indicate some variation across respondents within the VTs. Unlike the ICC(1) formula, the ICC(2) scores do not take into account the small number of respondents from each team ($M = 7.5$), and remain rather low. Another argument for aggregation, which is supported by Liao and Rupp (2005), is a theoretical one: most of our constructs are essentially team-level ones. Moreover, as noted by Chen and Bliese (2002), the low ICC(2) values may hinder the detection of existing relationships in aggregated data, meaning that we are not likely to find any relationships that are merely an artifact of the regression analysis—our main method of testing the hypotheses.

Results

In Table 1, we present the means, standard deviations, and correlations of the study variables at the individual level. It can be noted that most of the variables are more highly intercorrelated at the aggregate level (Table 2) than at the individual level, which is in line with previous studies (e.g., Simons & Roberson, 2003). Because we are interested in team-level analyses we concentrate on those results (Tables 2 and 3). In general, the VT members identified with their team relatively strongly ($M = 3.94$). Similarly, it seems that, on average, the fairness of the decision-making was rated as fairly good ($M = 3.58$). Face-to-face meetings did not correlate with geographical dispersion ($r = -.14$, n.s.), indicating that these two measures are independent of each other. Moreover, team size, our control variable, had an anticipated negative correlation with identification ($r = -.37$, $p < .05$), and this pattern remained largely the same in the subsequent regression analyses (Table 3). Finally, there was a significant correlation between procedural justice and identification ($r = .39$, $p < .01$), as could be expected from the reasoning based on the group-engagement model of procedural justice. This effect turned out to be marginally significant ($\beta = .24$, $p < .10$) when other variables were controlled for (Table 3, Step 2), because of our rather small sample size.

We followed the procedure recommended by Aiken and West (1991) in all the steps creating the interaction terms and in testing our two moderation hypotheses. We entered the interaction between procedural justice and face-to-face meetings

Table 1 Descriptive statistics and Pearson correlations among the variables at the individual level ($N = 293$)

Variables	<i>M</i>	SD	1	2	3	4
1. Team size	14.53	9.24				
2. Face-to-face meetings	2.80	1.04	.18**			
3. Geographical dispersion	5.26	2.74	.25**	-.04		
4. Procedural justice	3.49	0.73	-.28**	-.09	-.06	
5. Identification	3.88	0.76	-.17**	-.04	-.02	.40**

* $p < .05$; ** $p < .01$, one-tailed

Table 2 Descriptive statistics and Pearson correlations among the variables at the VT level ($N = 39$)

Variables	<i>M</i>	SD	1	2	3	4
1. Team size	10.54	7.25				
2. Face-to-face meetings	2.71	0.63	.17			
3. Geographical dispersion	4.69	2.42	.45**	-.14		
4. Procedural justice	3.58	0.40	-.41**	-.19	-.09	
5. Identification	3.94	0.31	-.37**	-.26	-.02	.39**

* $p < .05$; ** $p < .01$, one-tailed

Table 3 Hierarchical moderated regressions predicting identification with VTs ($N = 39$)

	Identification ^a			
	Step 1	Step 2	Step 3	Step 4
Control variable				
Team size	-.37*	-.30	-.47**	-.35*
Main effects				
Face-to-face meetings		-.15	-.16	-.09
Geographical dispersion		.11	.09	.27
Procedural justice (PJ)		.24	.12	.20
Moderators				
PJ \times Face-to-face meetings			-.46**	
PJ \times Geographical dispersion				.30*
R^2	.14	.24	.42	.31
Adjusted R^2	.12	.15	.33	.21

* $p < .05$; ** $p < .01$, one-tailed

^a The standardized regression coefficients are reported

into the equation in the third step (Table 3), after entering our control variable (Step 1) and testing for possible main effects (Step 2). As hypothesized (H1), the interaction term was negative and significant ($\beta = -.46$, $p < .01$). The interaction

between procedural justice and geographical dispersion was entered in the fourth step (Table 3), and it yielded a significant positive regression weight ($\beta = .30$, $p < .05$), as hypothesized (H2).

Simple slope analyses were conducted to confirm the regression results (Aiken & West, 1991). We calculated the conditional values for face-to-face meetings and geographical dispersion (one standard deviation above and below the mean). The analysis indicated that the relationship between perceived procedural justice and identification was significantly positive when there were few face-to-face meetings ($\beta = .72$, $p < .01$), but nonexistent when there were many ($\beta = -.10$, n.s.). The relationship between procedural justice and identification was not significant when the teams were dispersed in only a few locations ($\beta = .14$, n.s.), but it turned out to be strongly positive when they were geographically highly dispersed ($\beta = .58$, $p < .01$).

Discussion

The results of our study give support to our moderation hypotheses stating that the less there were face-to-face meetings or the greater the geographical dispersion of a VT, the stronger the relationship between procedural justice and identification with it. Our study was based on the group-engagement model (Tyler & Blader, 2003), according to which relational information is the starting point of the identification process. However, rare face-to-face meetings and dispersion in many locations may reduce traditional means of getting relational information and thereby causing a sense of uncertainty about a person's position in the group. According to the uncertainty management model of procedural justice (Van den Bos & Lind, 2002), in turn, people become especially sensitive to fairness perceptions under highly uncertain conditions. We adapted these basic premises of the two theories to VTs and got support for the idea that VT members become especially sensitive and responsive toward relational, within-group information such as the fairness of decision making when the frequency of face-to-face meetings is low and when geographical dispersion is high.

In this study, we found a significant positive correlation between perceived procedural fairness and identification. This relationship has been well established in other settings (e.g., Tyler & Blader, 2000, 2001), and is theoretically well grounded (Blader & Tyler, 2005). In other words, the VTs do not seem to differ from co-located teams in this respect. However, scrutiny of the interaction terms revealed that this effect existed only when the teams had low frequency of face-to-face meetings and when they were highly geographically dispersed. These two contextual features of VTs created special conditions for the relationship. We tackled this by applying the uncertainty model of procedural justice to our set-up and found it fruitful in explaining the contextual effects created by the lack of direct contacts and high dispersion.

In terms of the procedural justice literature, this study adds to the scarce research on how structure affects and moderates justice effects (Ambrose & Schminke, 2003; Schminke, Cropanzano, & Rupp, 2002). The role of structure has been largely

neglected, despite the work of pioneers such as Leventhal (1980) and Lind and Tyler (1988), who recognized the importance of context and contextual variables. We proposed two VT-specific contextual features and thus provided a new setting for studying the effects of structure. Since VTs are of growing importance in the organization of work, the study of their essential structural elements is also of societal relevance. We also continued, specified, and extended the work on justice and structure in virtual settings pioneered by Kurland and Egan (1999). First, we focused on virtual teamwork, and thus our results shed light on the interplay of justice and structure in this previously understudied virtual setting. Second, we concentrated on the moderating effects of VT-specific structural attributes on justice effects, which is yet another neglected area of inquiry.

Although not directly related to our main hypotheses, the rather high mean value of VT identification (Table 1) suggests that belonging to the VT is not problematic *per se* in a virtual environment. This is in line with findings that report no differences between identification in co-located and VTs (e.g., Mortensen & Hinds, 2001), but in both cases this contradicts the traditional assumption (e.g., Mannix et al., 2002) that identification is more difficult in virtual than in co-located settings. This matter is far from resolved, and drawing any robust conclusions based on current studies would be premature. Yet, they underline the need for more empirical study on identification with VTs.

The traditional assumption in research on VTs has been that face-to-face interaction is always superior to electronically or computer-mediated communication (CMC), a point neatly summarized by Kiesler and Cummings (2002). However, we found some evidence that the frequency of face-to-face meetings is not directly related to VT identification (Tables 2 and 3), suggesting indirectly that dependence on ICT in communication does not hinder identity formation in VTs, as the traditional reasoning would predict. This is, in fact, understandable in light of the social identity model of depersonalization effects (SIDE; Reicher, Spears, & Postmes, 1995; Postmes & Spears, 1998), which distinguishes between personal and group identity. According to this model, the anonymity and reduced interpersonal cues in CMC enhance group-based identity. Thus, the rather anonymous context of VTs, in which information about others is largely gathered via CMC, enhances group salience because individual differences are hard to detect (Lea, Spears, & Rogers, 2003). Therefore, SIDE would actually predict zero or even a negative relationship between the frequency of face-to-face meetings and VT identification.

The social identity model of depersonalization effects has also untangled other counter-intuitive and seemingly contradictory findings concerning CMC (e.g., Lea et al., 2003). For example, some studies report that the anonymity of CMC leads to liberating, anti-normative actions, while others report increased self-awareness and normative behavior (e.g., Lea, Spears, & De Groot, 2001). Given its relevance to VT research, the SIDE should be applied more to studies in virtual settings. However, researchers should exercise caution in making straightforward inferences from pure CMC studies to real life VTs, which seldom use solely mediated communication in their work. Still, especially in the early phases of a VT's life-cycle, the anonymity and depersonalization effects highlighted by the SIDE might be highly relevant.

Limitations and Future Directions

This study also has some limitations worth mentioning. We have used cross-sectional methodology that does not lend itself to the inference of causality. Moreover, most of our variables were based on self-reports and, therefore, it can be argued that our results may be vulnerable to common method variance. However, the aggregation of the self-report measures to the VT-level and the use of team-level data reduced the likelihood that response biases would explain our findings (Ambrose & Schminke, 2003). Additionally, the fact that we primarily studied statistical interactions, that these were significant, and that they occurred in opposite directions, gives us good reason to believe that our results are not merely artifacts caused by common method variance (Ambrose & Schminke, 2003; Evans, 1985). Identification could also be considered a process (Tajfel & Turner, 1979), and cross-sectional methodology captures only one moment of it. Therefore, longitudinal settings would be beneficial in promoting a more reliable and deeper understanding of identification with VTs.

We treated the two features of VTs as indicators of uncertainty, and it is, in principle, possible that certain other features of VTs may also be associated with high degrees of uncertainty. These include, for example, such attributes as diversity and the crossing of organizational or temporal boundaries (e.g., Gibson & Gibbs, 2006). It is possible that some of these features may be related only to certain forms of uncertainty (e.g., De Cremer & Sedikides, 2005). In future studies it would also be important to measure the various forms of uncertainty directly. Furthermore, the application of uncertainty reduction theory by Hogg (2004) in studying identification with VTs would be yet another interesting line of further research.

When there are few physical meetings and a team is dispersed into many locations, information on decision-making principles is mainly available in electronically mediated communication between the VT members. Under such conditions the decision-making principles are often communicated via e-mail or other electronic means, which leaves permanent written documents for later use. These documents could, in principle, be more accurate and sustaining than verbal communication. Thus, if decision-making procedures were properly communicated and restored in VTs, members of rarely meeting and highly dispersed teams might, in fact, receive clearer cues about the fairness of decision-making procedures than their counterparts who have to rely less on ICT. Given this, it seems quite clear that we need much more research on the potential differences between verbal and electronic means of communicating various forms of justice information, especially in long-term relationships.

The above reasoning is also in line with the findings of Jarvenpaa and Leidner (1999), according to which proactive electronic communication is one essential prerequisite of trust formation in fully VTs (i.e., teams whose members never meet). Trust is closely related to procedural justice and has often been considered its antecedent (Lewicki, Wiethof, & Tomlinson, 2005). The results of our study complement the trust and communication perspectives of VT research by explicitly introducing the concept of procedural justice and its relation to identification, a

variable rather unambiguously stated to be important in VTs (e.g., Fiol & O'Connor, 2005; Hinds & Kiesler, 2002; Martins et al., 2004).

Conclusion

Our study makes some further contributions to VT research beyond the ones mentioned above. There is still amazingly little empirical research on VTs in real working-life situations, as two recent reviews point out (Hertel et al., 2005; Martins et al., 2004). Moreover, previous studies have mainly used qualitative methodology, and there is a clear need for quantitative research conducted in field settings (Hertel et al., 2005). This study fills these gaps to some extent by presenting team-level, quantitative results from real VTs.

Recent reviews of VT research also conclude that VTs are essentially like other teams, but that the search for idiosyncrasies of VTs should continue (Hertel et al., 2005; Martins et al., 2004). Along these lines, perhaps our main contribution has been to show that the virtual context contains elements that may profoundly shape the way that some basic group processes such as perceptions of procedural justice and group identification are related to each other.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Ambrose, M. L., & Schminke, M. (2003). Organization structure as a moderator of the relationship between procedural justice, interactional justice, perceived organizational support, and supervisory trust. *Journal of Applied Psychology, 88*, 295–305.
- Ashforth, B. E., & Mael, F. A. (1989). Social identity theory and the organization. *Academy of Management Review, 14*, 20–39.
- Axtell, C. M., Fleck, S. J., & Turner, N. (2004). Virtual teams: Collaborating across distance. In C. Cooper & I. Robertson (Eds.), *International review of industrial and organizational psychology* (pp. 205–248). Chichester: John Wiley & Sons.
- Blader, S. L., & Tyler, T. R. (2005). How can theories of organizational justice explain the effects of fairness? In J. Greenberg & J. Collquitt (Eds.), *Handbook of organizational justice* (pp. 329–354). New Jersey, NJ: Lawrence Erlbaum.
- Bosch-Sijtsema, P. (2003). *Virtualness: A new organizational dimension*. Ridderkerk: Labyrinth Publication.
- Chen, G., & Bliese, P. D. (2002). The role of different levels of leadership in predicting self- and collective efficacy: Evidence for discontinuity. *Journal of Applied Psychology, 87*, 549–556.
- Cohen-Charash, Y., & Spector, P. E. (2001). The role of justice in organizations: A meta-analysis. *Organizational Behavior and Human Decision Processes, 86*, 278–321.
- Colquitt, J. A., Greenberg, J., & Scott, B. A. (2005). Organizational justice: Where do we stand? In J. Greenberg & J. Collquitt (Eds.), *Handbook of organizational justice* (pp. 589–619). New Jersey, NJ: Lawrence Erlbaum.
- Colquitt, J. A., Noe, R. A., & Jackson, C. L. (2002) Justice in teams: Antecedents and consequences of procedural justice climate. *Personnel Psychology, 55*, 83–109.
- De Cremer, D., & Sedekides, C. (2005). Self-uncertainty and responsiveness to procedural justice. *Journal of Experimental Social Psychology, 41*, 157–173.
- Duarte, D. L., & Snyder, N. T. (2006). *Mastering virtual teams: Strategies, tools, and techniques that succeed*. San Francisco, CA: Jossey-Bass.
- Evans, M. G. (1985). A Monte Carlo study of the effects of correlated and method variance in moderated multiple regression analysis. *Organizational Behavior and Human Decision Processes, 36*, 305–323.

- Fiol, C. M., & O'Connor, E. J. (2005). Identification in face-to-face, hybrid and pure virtual teams: Untangling the contradictions. *Organization Science*, *16*, 19–32.
- Gibson, C. B., & Cohen, S. G. (2003). *Virtual teams that work. Creating conditions for virtual team effectiveness*. San Francisco, CA: Jossey-Bass.
- 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. *Administrative Science Quarterly*, *51*, 451–495.
- Griffith, T. L., & Neale, M. A. (2001) Information processing in traditional, hybrid, and virtual teams: From nascent knowledge to transactive memory. *Research in Organizational Behavior*, *23*, 379–421.
- Hertel, G., Geister, S., & Konradt, U. (2005). Managing virtual teams: A review of current empirical research. *Human Resource Management Review*, *15*, 69–95.
- Hinds, P. J., & Kiesler, S. (2002). *Distributed Work*. Cambridge, MA: MIT Press.
- Hogg, M. A. (2004) Uncertainty and extremism: Identification with high entitativity groups under conditions of uncertainty. In V. Yzerbyt, C. M. Judd, & O. Corneille (Eds.), *The psychology of group perception: Perceived variability, entitativity, and essentialism* (pp. 401–418). New York: Psychology Press.
- James, L. R., Demaree, R. G., & Wolf, G. (1984). Estimating within-group interrater reliability with and without response bias. *Journal of Applied Psychology*, *69*, 85–98.
- Jarvenpaa, S. L., & Leidner, D. E. (1999). Communication and trust in global virtual teams. *Organization Science*, *10*, 791–815.
- Kiesler, S., & Cummings, J. N. (2002) What do we know about proximity and distance in work groups? A legacy of Research. In P. J. Hinds & S. Kiesler (Eds.), *Distributed work* (pp. 57–80). Cambridge, MA: MIT Press.
- Kirkman, B. L., Rosen, B., Tesluk, P. E., & Gibson, C. B. (2004). The impact of team empowerment on virtual team performance: The moderating role of face-to-face interaction. *Academy of Management Journal*, *47*, 175–192.
- Kurland, N. B., & Egan, T. D. (1999). Telecommuting: Justice and control in the virtual organization. *Organization Science*, *10*, 500–513.
- Lea, M., Spears, R., & De Groot, D. (2001). Knowing me, knowing you: Anonymity effects of social identity processes within groups. *Personality and Social Psychology Bulletin*, *27*, 526–537.
- Lea, M., Spears, R., & Rogers, P. (2003). Social processes in electronic teamwork: The central issue of identity. In S. A. Haslam, D. Van Knippenberg, M. J. Platow, & N. Ellemers (Eds.), *Social identity at work: Developing theory for organizational practice* (pp. 99–115). New York, NY: Psychology Press.
- Leventhal, G. S. (1980). What should be done with equity theory? In K. J. Gergen, M. S. Greenberg, & R. H. Willis (Eds.), *Social exchange: Advances in theory and research* (pp. 27–55). New York, NY: Plenum Press.
- Lewicki, R. J., Wiethof, C., & Tomlinson, E. C. (2005). What is the role of trust in organizational justice? In J. Greenberg, & J. Collquitt (Eds.), *Handbook of organizational justice* (pp. 247–270). New Jersey, NJ: Lawrence Erlbaum.
- Liao, H., & Rupp, D. E. (2005). The impact of justice climate and justice orientation on work outcomes: A cross-level multifoci framework. *Journal of Applied Psychology*, *90*, 242–256.
- Lind, E. A., & Tyler, T. R. (1988). *The social psychology of procedural justice*. New York, NY: Plenum Press.
- Lipnack, J., & Stamps, J. (2000). *Virtual teams: People working across boundaries with technology*. New York, NY: Wiley & Sons.
- Lipponen, J., Helkama, K., Olkkonen, M., & Juslin M. (2005) Predicting the different profiles of organizational identification. *Journal of Occupational and Organizational Psychology*, *78*, 1–17.
- Mael, F. A., & Ashforth, B. E. (1992). Alumni and their alma mater: A partial test of the reformulated model of organizational identification. *Journal of Organizational Behavior*, *13*, 103–123.
- Mannix, E. A., Griffith, T. L., & Neale, M. A. (2002) The phenomenology of conflict in distributed work teams. In P. J. Hinds & S. Kiesler (Eds.), *Distributed work* (pp. 213–233). Cambridge, MA: MIT Press.
- Martins, L. L., Gilson, L. L., & Maynard, M. T. (2004). Virtual teams: What do we know and where do we go from here? *Journal of Management*, *30*, 805–835.
- Maznevski, M. M., & Chudoba, K. M. (2000). Bridging space over time: Global virtual team dynamics and effectiveness. *Organization Science*, *11*, 473–492.

- Moorman, R. H. (1991). Relationship between organizational justice and organizational citizenship behaviors: Do fairness perceptions influence employee citizenship? *Journal of Applied Psychology*, 76, 845–855.
- Mortensen, M., & Hinds, P. J. (2001). Conflict and shared identity in geographically distributed teams. *International Journal of Conflict Management*, 12, 212–238.
- Nilles, J. M. (1994). *Making telecommuting happen*. New York, NY: Van Nostrand Reinhold.
- Olkkonen, M.-E., & Lipponen, J. (2006). Relationships between organizational justice, identification with organization and work unit, and group-related outcomes. *Organizational Behavior and Human Decision Processes*, 100, 202–215.
- Postmes, T., & Spears, R. (1998). Deindividuation and antinormative behavior: A meta-analysis. *Psychological Bulletin*, 123, 238–259.
- Powell, A., Piccoli, G., & Ives, B. (2004). Virtual teams: A review of current literature and directions for future research. *Data Base for Advances in Information Systems*, 35, 6–36.
- Reicher, S. D., Spears, R., & Postmes, T. (1995). A social identity model for deindividuation phenomena. *European Review in Social Psychology*, 6, 161–198.
- Schminke, M., Cropanzano, R., & Rupp, D. E. (2002). Organizational structure and fairness perceptions: The moderating effects of organizational level. *Organizational Behavior and Human Decision Processes*, 89, 881–905.
- Simons, T., & Robertson, Q. (2003). Why managers should care about fairness: The effects of aggregate justice perceptions on organizational outcomes. *Journal of Applied Psychology*, 88, 432–443.
- Tajfel, H., & Turner, J. (1979). An integrative theory of intergroup conflict. In W. G. Austin, & S. Worschel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Monterey, CA: Brooks/Cole.
- Tyler, T. R., & Blader, S. L. (2000). *Cooperation in groups: Procedural justice, social identity and behavioural engagement*. Philadelphia, PA: Psychology Press.
- Tyler, T. R., & Blader, S. L. (2001). Identity and cooperative behavior in groups. *Group Processes & Intergroup Relations*, 4, 207–226.
- Tyler, T. R., & Blader, S. L. (2003). The Group Engagement Model: Procedural Justice, Social Identity, and Cooperative Behavior. *Personality and Social Psychology Review*, 7, 349–361.
- Van den Bos, K., & Lind, E. A. (2002). Uncertainty management by means of fairness judgments. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 34, pp. 1–60). San Diego, CA: Academic Press.
- Van den Bos, K., Wilke, H. A., & Lind, E. A. (1998). When do we need procedural fairness? The role of trust in authority. *Journal of Personality and Social Psychology*, 75, 1449–1458.
- Wiesenfeld, B. M., Raghuram, S., & Garud, R. (1999). Communication patterns as determinants of organizational identification in a virtual organization. *Organization Science*, 10, 777–790.