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Antecedents of Identity in Virtual Teams

MARKO HAKONEN AND SATU KOIVISTO

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INTRODUCTION

The need of organizations to let their experts or sub-teams of experts work near customers around the globe, and information and communication technology (ICT) enabling teamwork from a distance, are often mentioned as the major drivers behind the increased use of virtual teams (VTs) in working life (Vartiainen, 2006). The literature on VTs has been rapidly accumulating but as recent reviews argue (Hertel, Geister, & Konradt, 2005; Martins, Gibson, & Maynard, 2004) surprisingly little empirical research has been carried out, especially in real-life teams. Hence, this new organizational form provides a fresh context for theory testing and building.

Many authors in the virtual team literature point out that shared VT identity is crucial for VT success because it provides a sense of belonging despite the relative lack of face-to-face interaction (Gibson & Cohen, 2003; Hinds & Kiesler, 2002; Lipnack & Stamps, 2000). However, most VTs usually consist of sub-groups or individuals working in different locations, and the members of distributed groups have also many other affiliations. Besides the VT membership they are members of local work groups, networks, line and matrix organizations and the whole company (e.g., Hinds & Kiesler, 2002). In practice, this often means that building a shared VT identity across distributed subgroups and individuals is one major challenge for VTs (e.g., Wiesenfeld, Raghuram, & Garud, 1999). In this article we concentrate on VT-level identification.

Few empirical studies on identification with VTs (Fiol & O'Connor, 2005) have been undertaken. The existing research (e.g., Bouas & Arrow, 1996; Mortensen & Hinds, 2001; Wiesenfeld et al., 1999) is, however, promising.

For instance, Wiesenfeld et al. (1999) suggest that identification is important since it enhances, for example, cooperation. Furthermore, Mortensen and Hinds (2001) found that shared team identity was associated with less conflict in new product development teams but that the level of identification was the same in co-located and distributed teams. The latter finding could be interpreted to suggest that identity dynamics are rather similar in co-located and virtual teams. We contribute to these lines of research by examining how identification with VTs is related to such structural factors as the degree of virtuality, team size, cultural diversity within the team and team tenure. In addition, we test how organizational justice variables interact with identification. In co-located settings there is growing evidence that organizational justice, that is, perceived fairness of decision making and interpersonal treatment, are strongly linked to identification (Lind & Tyler, 1988). To our knowledge especially the latter form of justice judgments has not been studied in the context of VTs.

In this article we study the antecedents of identification from the perspective of social identity approach (Tajfel & Turner, 1979). Among others, Fiol and O'Connor (2005) have demonstrated the potential fruitfulness of the social identity approach also in VT research. They state that prior research on identification with VTs is too focused on VT characteristics and on the communication technology used. We will incorporate previous literature and empirical findings on group identification (e.g., Tajfel & Turner, 1979) and organizational justice based on social identity approach (Lind & Tyler, 1988) into the research on VTs. In general, our approach and theories as applied in this study are deeply rooted in the social psychology of organizations.

Social identity approach

The social identity approach provides a theoretical framework for the relationship between individual and group. Specifically, it consists of two distinct theories: the original social identity theory (e.g., Tajfel & Turner, 1979), and the more recent self-categorization theory (Turner, Hogg, Oakes, Reicher & Wetherell, 1987). Despite certain differences, both theories share the same fundamental assumption that individuals define themselves in terms of their social group memberships and that group-defined self-perception produces distinctive effects on social behavior and inter-group relations (Hogg & Abrams, 1988; Turner, 1999). This means that the more an individual conceives of him or herself in terms of membership in a group or, in other words, identifies with the group, the more his or her attitudes and behavior are governed by this group membership (Hogg & Abrams, 1988; Van Knippenberg & van Schie, 2000).

This social psychological theorizing differs from other more sociological approaches to identity. Perhaps the most influential alternative stream of re-

search on organizational identity is grounded in the work of Dutton, Dukerich, and Harquail (1994). This approach mainly concentrates on organizational level of the identity concept and underlines the importance of construed organizational images. The main difference between these two approaches can be seen in focus: whereas the social identity approach concentrates on the dynamics of individuals in a group (e.g., VT) the more sociological theorizing underlines the discourses regarding identity within and outside organizations (e.g., Rometsch & van Rekom, 2006).

During the past five years, social identity principles have been increasingly applied to the study of organizational psychological processes (e.g., Haslam, 2001; Hogg & Terry, 2001). In this context, organizational or team membership is understood to reflect on the self-concept in the same way that other social memberships do (Ashforth & Mael, 1989; Hogg & Terry, 2001). Thus, organizational identification is defined as *"the perception of oneness with or belonging to a group"* (Ashforth & Mael, 1989, p. 34). Moreover, it is suggested that this group-based self-conception leads to activities that are congruent with this identity.

According to the self-categorization theory (Turner et al., 1987), different levels of self-definition (e.g., self as individual or self as group member) should be related to distinct sets of needs or motivators. When people categorize themselves at the personal level, they should be motivated to do things that promote their personal identity as individuals (e.g., personal advancement). When categorization and social identity are salient, they should be associated with motivation to do things that promote individuals' social identity as group members, for example, through cooperation and enhancement of group goals. Accordingly, empirical studies have shown that group identification is linked to various important outcomes, such as high levels of extra-role behaviors (e.g., Tyler & Blader, 2000; 2001; see Riketta, 2005, for a review). As noted above, in this study we concentrate on identification with a special kind of group, a VT.

Structural antecedents

The number of potential structural antecedents of identification with VTs is, naturally, extensive. In this article we have chosen to study four structural variables based on a coherence criterion: we strive for theoretical coherence. In other words, we selected such structural variables that can theoretically be plausibly related to identification using the social identity principles. Apart from that, adding large amounts of variables in statistical analysis with a small sample (N = 91) is generally considered to be problematic and limits our selection.

Virtuality

In VT literature one of the elementary debates concerns the definition of a VT. According to recent reviews of the literature (Hertel et al., 2005; Martins et al., 2004), it is a common notion that virtuality is a matter of degree. Indeed, there are more and less virtual teams, and we also share the view that virtuality should be seen as a continuum rather than as an absolute state. In addition, different authors identify different aspects of VTs as definitional. It seems rather clear that for a VT to be a team it should consist of a relatively small number of people (more than one person) trying to achieve a common goal (e.g., Hertel et al., 2005; Lipnack & Stamps, 2000). Regarding the virtuality of a team we highlight two points. Firstly, we agree with most authors (e.g., Bosch-Sijtsema, 2003; Duarte & Snyder, 1999; Hertel et al., 2005) that for a team to be virtual at least one of its members must work in a different location from others. Secondly, we take the stance (see e.g., Fiol & O'Connor, 2005; Kirkman, Rosen, Tesluk, & Gibson, 2004, for similar views) that the number of face-to-face meetings is the second definitional feature of virtuality. Many authors also include other features like crossing temporal, cultural, and organizational boundaries (e.g., Lipnack & Stamps, 2000) in their definitions of a VT, but we consider these non-definitional tendencies, potentially causing contextual complexity to VTs (Vartiainen, 2006). Similarly, the use of technology is usually an important feature of VTs, but as some authors have found (e.g., Griffith & Neale, 2001), co-located teams may use as much technology in their communication as VTs do. Thus, we treat the use of technology as a contextual complexity feature, but not as a definitional attribute of VTs.

From the social identity viewpoint the degree of virtuality is related to social category salience (Turner, 1987; Hogg & Terry, 2000). We tend to form social categories more easily from the groups which we meet often. Therefore, it seems plausible that the higher the virtuality, the lower the category salience. Salient group categories, in turn, facilitate group members' identification with the group (Fiol & O'Connor, 2005). Since we use the number of face-to-face meetings as an indicator of virtuality, we hypothesize as follows:

> H1: The higher the virtuality of the VT (i.e., the lower the number of face-to-face meetings), the lower the identification with it.

Team size

Traditionally, team size has been perceived as detrimental to group performance (Haslam, 2001). However, there are indications that the effects of team size may be different in VTs as compared with co-located teams, and that these differences may be due to task type and technology used (Martins et al., 2004). In the social identity approach, the size of a group has been viewed as

a determinant of group identification (e.g., Haslam, 2001). According to this theoretical approach, it is plausible to argue that the larger the team is, the harder it is to perceive it as a salient social category, and consequently to identify with it. This follows from Brewer's (1991, 1993) proposition that people aim at gaining optimal distinctiveness, that is, balancing individual distinctiveness with the need for social category memberships. Identification with large groups is supposed to form a threat to identity as it implies identification with a large number of people. Identification with smaller groups, on the other hand, is considered to be safer, as these kinds of groups provide a sufficient level of distinctiveness and at the same time fulfill the need for inclusiveness. Other arguments also support the assumption that large team size relates negatively to group identification. One could, for example, expect that distance between individuals and sub-groups, a key feature in VTs, further impedes identification with the whole VT. Recent research in other settings also suggests that people identify more with face-to-face groups than with larger entities (Lipponen, Helkama, & Olkkonen, 2005; van Knippenberg & van Schie, 2000). Thus, our hypothesis is:

H2: The larger the size of the VT, the lower the identification with it.

Cultural diversity

The results of the effects of cultural and other types of diversity are extremely mixed (Williams & O'Reilly, 1998). Cultural diversity might increase team performance, since different viewpoints enrich the expression of novel ideas and thus increase effectiveness. However, the restricted communication might increase misunderstandings and conflicts between team members from different cultural backgrounds (Hertel et al., 2005). One should note that high identification does not equal good performance or few conflicts even though it is probably related to them. Hence, the above reasoning might not be relevant for this study. For example, Mortensen and Hinds (2002) form two contradictory hypotheses regarding boundary agreement in VTs. On the one hand they suggest that the "out of sight, out of mind" problem makes VT members ignore their remote colleagues. On the other hand they consider that especially in multinational VTs, cultural diversity may increase the novelty and consequently the salience of remote individuals and subgroups. In their study the latter hypothesis was supported, but it is important to note that they also found that boundary agreement is not related to identification.

From the social identity viewpoint, cultural diversity is a natural faultline along which social categories and consequent identifications are formed (e.g., Jehn, Northcraft, & Neale, 1999). The theory suggests that people are more likely to identify with a group the more similar they are to the group. This as-

sumption is explained by the idea that group identification is based on the categorization of self as similar to the others in the same category (Turner et al., 1987). Thus, it is argued that cultural diversity relates negatively to group identification, and we hypothesize as follows:

> H3: The higher the cultural diversity in the VT, the lower the identification with it.

Team tenure

The effects of team tenure, that is the length of time a person has worked in a VT, have not been extensively studied in the VT literature. For example, the recent reviews of VT literature do not discuss the effects of team tenure (Hertel et al., 2005; Martins et al., 2004). However, Mortensen and Hinds (2002) found that team tenure was positively related to boundary agreement in VTs. They explain the finding by suggesting that long team tenure leads to repeated interactions which, in turn, increase shared understanding. Nevertheless, as noted above, they found that boundary agreement and identification are not related.

In his meta-analysis of organizational identification literature Riketta (2005), however, found 25 studies which consistently report moderate positive correlations between tenure and identification. As above, it is natural to explain this trend with the notion that the longer time a person has interacted with the team, the more salient that team becomes as a social category and the easier it is to identify with it. We see no reason why this could not apply to virtual as well as to co-located settings. Accordingly, our fourth hypothesis is:

> H4: The longer the team tenure of a VT member, the stronger his/her identification with that VT.

Justice and identification

Here justice refers to a long research tradition within social psychology studying what persons perceive to be fair or unfair and how they react to this. This tradition started with studies in legal settings, but has recently been applied rather extensively to an organizational context (Colquitt, Greenberg, & Zapata-Phelan, 2005). The term organizational justice simply refers to applying the theories and research streams of this kind of social justice research to organizations.

Organizational justice literature generally distinguishes between three types of justice (Greenberg & Cropanzano, 2001). *Distributive justice* refers to fairness perceptions of an outcome of any organizational resource allocation (Deutsch, 1985). *Procedural justice* means the perceived fairness of formal decision-making procedures and principles (Lind & Tyler, 1988) or, in other

words, quality of decision-making (Tyler & Blader, 2000). *Interactional justice*, in turn, refers to dignity, politeness and respect, which are communicated informally during decision-making or other interpersonal encounters (Bies & Moag, 1986), that is, the quality of interpersonal treatment (Tyler & Blader, 2000). Here we study how the two latter forms of justice, procedural and interactional, are related to identification with VTs.

After many years of research, it is now generally acknowledged that employees' perceptions of organizational justice are critical factors influencing various important work outcomes, such as organizational commitment, job satisfaction, organizational citizenship behavior and turnover intentions (see Cohen-Charash & Spector, 2001 and Colquitt, Conlon, Wesson, Porter, & Ng, 2001, for recent reviews). Given these important consequences of perceived justice, researchers have been trying to explain why people care about justice. For the effects of distributive justice, the dominant explanation has focused on the positive economic consequences that fair outcomes have (Folger & Cropanzano, 1998). That is, fair outcomes are valued because they are closely related to favorable outcomes. In early research, this instrumentally based explanation was also offered for the procedural justice effects. According to the self-interest model of procedural justice, fair procedures are valued because they ultimately lead to favorable outcomes (Lind & Tyler, 1988).

An alternative explanation is provided by the group-value model (Lind & Tyler, 1988; Tyler & Lind, 1992; Tyler, Degoey, & Smith, 1996), which emphasizes identity-relevant motivations behind the concern with fair procedures. The model suggests that procedural justice matters because it communicates information to group members about the quality of their relationship with authority figures and other group members. In particular, fair procedures and treatment indicate a positive, respected position within the group and promote pride in group membership. It is suggested that these feelings of respect and pride, in turn, are related to group identification and other, positive group-related attitudes and behavior (e.g., extra-role behaviors and cooperation; Tyler et al., 1996).

A growing body of empirical studies in co-located settings has supported the claim that procedural and interactional justice are related to identification (Tyler & Blader, 2000; 2001). In addition, recent meta-analyses show that procedural and interactional justice have significant correlations with affective commitment, a concept closely related to identification (Cohen-Charash & Spector, 2001; Colquitt et al., 2001). Taking the above theories and empirical findings together, we hypothesize as follows:

H5: Perceptions of procedural justice are positively related to identification with the VT.

H6: Perceptions of interactional justice are positively related to identification with the VT.

METHODS

Procedure and respondents

This study was carried out by means of cross-sectional survey methodology. The data were gathered with a web-based questionnaire during the years 2004 and 2005 from five companies participating in research projects carried out by the authors' university department. The questionnaires were sent to the members of the eleven VTs participating in Finnish-based multinational IT companies. All the VTs consisted of specialists conducting non-routine tasks. The work of the teams could be characterized as research and development, and it was generally project-based.

The respondent teams were selected in collaboration with the contact person in each company and in agreement with the team leaders. The minimum conditions for selection were the major definitional features of VTs presented above, that is, that the groups had more than one member trying to achieve a common goal, and that the team members or subgroups of them were located in different towns (actually in different countries in this sample). Moreover, the respondents communicated mainly via ICT (i.e., not face-to-face).

In this study we use a sub-sample of a larger dataset (N = 230), since the other groups failed to meet some of the critical definitional criteria. For example, one group was dropped from this study since it had over 200 members, which hardly formed a single team. In the sub-sample used here 154 respondents received individual e-mails with an introduction to the study and a web address through which they could fill in the questionnaire confidentially. In the e-mail and in the questionnaire the respondents were prompted to answer all the questions relating to their named VT. It was stressed that even though in the items the term "team" was consistently used, the respondents should think about their VT named in the e-mail and in the questionnaire cover page when answering. In total 91 acceptable questionnaires were returned, a response rate of 59.1 percent. Respondents were predominantly male (67.8 %), with an average age of 34.6 years (SD = 8.2). Their mean team tenure was 12.9 (SD = 9.7) months and they represented 21 nationalities altogether. We used individual responses and did not aggregate the data to team level due to our small sample.

Measures

Virtuality. We followed Kirkman et al. (2004) in assessing virtuality simply by measuring the number of face-to-face meetings. The less often there are face-to-face meetings, the more virtual the team is. Because the number of both formal and informal team meetings was covered in the questionnaire, the re-

sponses were added together and averaged to create a measure of virtuality. The response scale in both questions was: never (1), less than monthly (2), monthly (3), weekly (4) and daily (5).

Team size. The VT leaders provided us with a list of team members' names, nationalities and contact information. We coded the actual team sizes to each individual response.

Cultural diversity. As we did with the team size, based on the information gathered from respondent VT leaders, we coded the objective number of different nationalities of each team to the individual responses.

Team tenure. The time (in months) a VT member had worked for the VT was asked with a single open-ended question and coded to the data.

Procedural justice. Employees' perceptions of procedural justice were measured with five items derived from previous scales by Moorman (1991) and Tyler and Blader (2000). The five items reflect the aspects of fair procedures suggested by Leventhal (1980): accuracy of information, correctability, bias-suppression, consistency and representativeness in the decision-making process. The response scale ranged from (1) "strongly disagree" to (5) "strongly agree". The response focus was aimed at team level by starting each question with, "When decisions are made in our team…". The claims after the focus-creating lead tapped the procedural aspects outlined above (e.g., "… they are based on accurate information"). The Cronbach's alpha for the scale was 0.71.

Interactional justice. Moorman's (1991) measure was used as the basis for the construction of the interactional justice scale. As Colquitt et al. (2001) note, Moorman's scale has some conceptual incoherence since it includes items that measure bias-suppression and representativeness (or voice), which are usually considered procedural issues. We omitted the overlapping items and added one item measuring respect, a central part of the definition of interactional justice (Bies, 2001; Bies & Moag, 1986). Again, the team level was highlighted by the use of a common lead: "In our team…". The items tapped the quality of treatment (e.g., "…everyone is treated with respect"). The response scale was same as that for the procedural justice measure. The four-item scale achieved quite good internal consistency ($\alpha = 0.86$).

To test the empirical distinctiveness of the two justice dimensions, an explorative factor analysis (maximum likelihood extraction) with oblimin rotation was conducted. The factor analysis yielded two components (eigenvalue of factor 1 = 4.08; component 2 = 1.6; variance explained by component 1 = 45.3 %; component 2 = 17.5 %) which accounted for 62.8 percent of the total variance. All the procedural justice items loaded on the first component and all the interactional justice items on the second component. There were no cross-loadings above 0.40.

Team identification. Identification with VT was measured with a modified version of an organizational identification scale developed by Mael and Ash-

forth (1992). One original item regarding public opinions was not used since VTs seldom achieve the same level of public recognition as organizations do. In addition, the questions were modified to assess the team level identification (e.g., "When I talk about this team, I usually say 'we' rather than 'they'"). The response scale was similar to that for the justice items. The Cronbach's alpha for this five-item scale was 0.84.

RESULTS

The descriptive statistics and correlations between our variables are presented in Table 1. Interestingly, only the justice variables correlated significantly with VT identification. Virtuality and team size were negatively related to identification, but the correlations remained non-significant.

Table 1 Descriptive statistics and Pearson correlations among the variables (N = 91)

Variables	M	SD	1	2	3	4	5	6
1 Virtuality [a]	2.49	1.10						
2 Team size	18.92	11.03	0.21*					
3 Cultural diversity	6.07	1.74	–0.05	0.21*				
4 Team tenure (months)	12.93	9.66	–0.10	–0.30**	0.05			
5 Procedural justice	3.35	0.67	–0.15	–0.25*	0.14	0.24*		
6 Interactional justice	4.08	0.81	–0.30**	–0.39***	0.09	0.21*	0.47***	
7 Identification	3.77	0.89	–0.04	–0.12	0.04	0.04	0.44***	0.48***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two tailed.

[a] The number of face-to-face meetings; the higher the number of face-to-face meetings, the lower the virtuality.

To test our hypotheses we regressed both the structural variables and the justice variables on identification with VT. The results are shown in Table 2. Contrary to our hypotheses, virtuality, team size, cultural diversity and team tenure were not related to identification. However, both procedural and interactional justice perceptions were strongly related to identification with VT ($\beta = 0.30$, $p < 0.01$ and $\beta = 0.41$, $p < 0.001$ respectively). In order to investigate the relative importance of structural and justice variables, we entered them into analysis in two steps. The structural variables accounted for 2 % of

the variance of identification, and adding the justice variables significantly increased the amount of variance explained ($R^2 = 0.31$, $p < 0.001$; $R^2_{change} = 0.29$, $p < 0.001$).

Table 2 Hierarchical regressions predicting identification with VT (N = 91)

	Identification	
	Step 1 β	**Step 2** β
Structural variables		
Virtuality [a]	0.02	0.10
Team size	–0.15	0.06
Cultural diversity	0.07	–0.04
Team tenure (in months)	0.00	–0.09
Justice variables		
Procedural justice		0.30**
Interactional justice		0.41***
R^2	0.02	0.31***
R^2_{change}		0.29***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two tailed.
[a] The number of face-to-face meetings; the higher the number of face-to-face meetings, the lower the virtuality.

We also tested whether the structural variables would interact with each other and thus have a moderating effect on identification as suggested by some VT researchers (e.g., Fiol & O'Connor, 2005; Kirkman et al., 2004). These tests were carried out by adding the interaction terms one at a time to the equations in which the independent variables were regressed on identification. None of the tested interactions turned out to be significant.

DISCUSSION

Our finding, according to which the virtuality, or to be exact, the number of face-to-face meetings, of the VT was not related to identification, is at first

glance rather surprising. It seems to contradict our assumption that virtuality blurs VT–level social category salience and hence impedes identity formation with VT. However, in their seminal study, Wiesenfeld et al. (1999) found that face-to-face communication had neither a main nor a moderating effect on identification. Instead, they found that electronic communication is the critical means of creating and sustaining identification with the organization, especially for highly virtual employees. Their interpretation was that electronic communication may make differences between virtual workers less salient. When comparing the results of these two studies, it should be kept in mind that Wiesenfeld et al. (1999) studied teleworkers whereas we studied members of VTs. Their results may not be generalizable to dynamic teamwork. On the other hand, our results may be due to the somewhat simplistic operationalization of virtuality. Hertel et al. (2005) suggest, for example, the relative amount of face-to-face communication and mediated communication, and the average distance between team members, as potential measures of virtuality (see also Kirkman & Mathieu, 2005). In sum, researchers should not abandon the social category salience explanation of the effects of virtuality based solely on the results of this study.

Similarly, the finding that team size is not related to identification contradicts our expectations. This is not very surprising since Kirkman et al. (2004) did not find a relationship between team size and their outcome variables, namely process improvement and customer satisfaction. However, one should note that the outcome variables in these two studies were rather different in nature. Moreover, it has been noted that team size affects VTs differently than it does face-to-face teams (see Martins et al., 2004, for a review). Here technology and task type may affect the dynamics of VTs. Unfortunately, we were able to control neither for the specific information and communication technology used nor for the task type. For example, Hertel, Konradt, and Orlikowski (2004) found that task interdependence is crucial for VT performance. The more the tasks of VT members were coupled with each other, the stronger were the demands for team members to coordinate, communicate and cooperate. The coordination and communication needs might also be related to VT identification since the VT could become more salient when the team members interact frequently. However, in VTs generally, members might predominantly interact (via electronic media) with only one or few colleagues at a time, and thus their relations might remain more interpersonal than social regardless of team size. Moreover, it might be that other factors than size per se (Brewer, 1991; 1993) might be more influential in the formation of distinctive social categories in VTs. For instance, Polzer, Crisp, Jarvenpaa, and Kim (2006) found that the geographical faultlines and the homogeneity of subgroups of VTs made categorizations salient and subsequently reduced inter-group trust. Thus, regardless of team size, the whole

VT could remain a blurred social category, with which a member might find it hard to identify. These possibilities call for further research.

The mixed findings on diversity effects in the literature (e.g., Jehn et al., 1999; Williams & O'Reilly, 1998) make it easier to understand our findings on cultural diversity. The different elements of social category diversity effects, like the increased social category salience due to novelty effects of the diversity or restricted communication possibilities weakening the salience of the VT, may override each other (Mortensen & Hinds, 2002). In addition, our measure of cultural diversity was rather simplified, and it is possible that it did not capture the diversity as well as more complex indices (e.g., Mortensen & Hinds, 2001).

The independence of team tenure and identification is more overwhelming than the fall of the previous three hypotheses regarding structural variables and VT identity. The result might be due to the rather extreme degree of virtuality of our sample. In global virtual teams even the long tenure might not pave the way for social category salience and identification. Another possible explanation might be that in real life VTs (note that in our data no organizational boundaries were crossed) the members might know each other in varying degrees when entering the VT, and thus the team tenure is not related to familiarity. Since familiarity with other members was not measured, we cannot refute the possibility that it could have fully explained the social category salience or at least mediated the relationship between team tenure and identification.

In sum, the structural variables did not seem to have hypothesized effects of VT identification. This does not, however, diminish the plausibility of social category salience explanations per se. It just emphasizes the importance of clear operationalizations and the need for further research on the interplay of different structural characteristics in VTs.

This study gave a strong indication that procedural and interactional justice are important in VTs. Procedural and interactional justice were strongly positively related to identification with VTs. These results were in line with assumptions of the group-value model of organizational justice (Lind & Tyler, 1988), and suggest that both the quality of decision making and the quality of interaction do, indeed, convey identity-relevant information to VT members. This occurs in spite of the intuition that information about decision making and fair treatment would be more difficult to gather in virtual settings. In virtual contexts, these cues are mostly available in electronically mediated communication between the VT members. In fact, one could speculate that in VTs, decision-making principles and interpersonal treatment 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 in co-located

settings. Thus, if decision making and positive social cues were properly communicated and restored in VTs, members of virtual teams might, in fact, receive clearer cues about the fairness of decision-making procedures and fairness of interpersonal treatment than their co-located counterparts.

As mentioned earlier, identification is often seen as a key success factor in VTs (e.g., Fiol & O'Connor, 2005). Hence, our results suggest that procedural and interactional justice – constructs understudied in the VT literature – might be very important factors for VT success.

Limitations and further research

There are some limitations in this study that are worth mentioning. The problems in operationalizing virtuality and cultural diversity are discussed above. In general, we also had to face the nature of the questionnaire: many research interests, limited length of the questionnaire sent to busy respondents, and technical limitations of the on-line survey software all affected the research setting. Many interesting variables could not be studied, and the contextual information of the VTs was rather limited. Furthermore, even though we have used terms like antecedent, consequence, explanation and effect in the title and some parts of our article for the sake of simplicity, we can not, naturally, infer causality from the present cross-sectional study. Longitudinal studies of VTs might overcome this problem. Moreover, the use of self-report measures alone naturally places the reliability and validity of the findings at risk due to common method variance. This was partially tackled by using objective, team-level data (team size and cultural diversity). Since quantitative field research on VTs is rather rare and has been called for (Hertel et al., 2005), our study helps to fill this gap. However, our small sample forced us to keep our analyses at individual level and prevented us from doing group-level analysis (e.g., Liao & Rupp, 2005). The small sample size may also have prevented some relations, like the effect of team size on identification, from becoming statistically significant. Moreover, the small and rather selective sample of Finnish-based organizations and VTs in the ICT sector doing research and development work limits the generalizability of present results to the studied context. Larger samples and other research approaches are needed to inform us in more detail on the dynamics related to identification with VTs.

Conclusion

Taken as a whole, the results of the present study suggest that VT researchers might want to explore identification and justice in VTs in more detail, especially insofar as arguments and findings of the value of VT-level identity to VT success are not seriously challenged. This work has started (e.g., Mortensen & Hinds, 2001; 2002), but field studies are still rather rare (Hertel

et al., 2005; Martins et al., 2004). Moreover, the wider application of the social identity approach is certainly a worthwhile subject for further VT research (Fiol & O'Connor, 2005). Our main finding was that justice matters in forming and sustaining shared identity with VTs. Since procedural justice is largely about the perceived quality of decision making, it seems that transparency in important decisions is crucial to identity formation in VTs. Transparency enables the VT members to perceive how the decisions are made and justified, and probably reduces suspicions of unfairness. Furthermore, because VT members interact mainly via technology, the quality of treatment (i.e., interactional justice) is usually manifested in electronic communication. Therefore, our results suggest that VT members should be extremely sensitive in their electronic interactions. However, further research on team structure, justice and identification is urgently needed in order to elaborate our findings and to obtain more robust results.

REFERENCES

Adams, J. S. (1963). Toward an understanding of inequity. *Journal of Abnormal and Personality Psychology*, 67, 422–436.

Allen, T. (1977). *Managing the flow of technology*, Cambridge, MA: MIT Press.

Ashforth, B. E. and Mael, F. A. (1989). Social identity theory and the organization. *Academy of Management Review*, 14, 20–39.

Bell, B. S. and Kozlowski, S. W. J. (2002). A typology of virtual teams: Implications for effective leadership. *Group and Organization Management*, 27, 14–49.

Bies, R. J. (2001). Interactional (in)justice: The sacred and the profane. In J. Greenberg & R. Cropanzano (Eds.), *Advances in organizational justice* (pp. 89–118). Stanford, CA: Stanford University Press.

Bies, R. J. and Moag, J. S. (1986). Interactional justice: Communication criteria of fairness. In R.J. Lewicki, B. H. Sheppard and M. H. Bazerman (Eds.), *Research on negotiation in organizations* (Vol.1, pp. 43–55). Greenwich, CT: JAI Press.

Blader, S. L. and Tyler, T. R. (2005). How can theories of organizational justice explain the effects of fairness? In J. Greenberg and J. Colquitt (Eds.), *Handbook of organizational justice* (pp. 329–354). New Jersey, NJ: Lawrence Erlbaum.

Bosch-Sijtsema, P. (2003). *Virtualness: A new organizational dimension*. Ridderkerk: Labyrint Publication.

Bouas, K. S. and Arrow, H. (1996). The development of group identity in computer and face-to-face groups with membership change. *Computer Supported Cooperative Work*, 4, 153–178.

Brewer, M. B. (1991). The social self: On being the same and different at the same time. *Personality and Social Psychology Bulletin*, 17, 475–482.

Brewer, M. B. (1993). The role of distinctiveness in social identity and group behavior. In M. A. Hogg and D. Abrams (Eds.), *Group motivation: Social psychological perspectives* (pp. 1–16). New York: Harvester Wheatsheaf.

Brockner J. and Wiesenfeld, B. M. (1996). An integrative framework for explaining reactions to decisions: The interactive effects of outcomes and procedures. *Psychological Bulletin*, 120, 189–208.

Campion, M. A., Medsker, G. J. and Higgs, A. C. (1993). Relations between work group characteristics and effectiveness: Implications for designing effective work groups. *Personnel Psychology*, 46, 823–850.

Cohen-Charash, Y. and 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., Conlon, D. E., Wesson, M. J., Porter, C. O. L. H. and Ng, K. Y. (2001). Justice at the Millennium: A meta-analytic review of 25 years of organizational justice research. *Journal of Applied Psychology*, 86, 424–445.

Colquitt, J. A., Greenberg, J. and Zapata-Phelan, C. P. (2005). What is organizational justice? A historical overview. In J. Greenberg and J. Colquitt (Eds.), *Handbook of organizational justice* (pp. 3–56). New Jersey, NJ: Lawrence Erlbaum.

Cropanzano, R. and Greenberg, J. (1997). Progress in organizational justice: Tunneling through the maze. In: Cooper, C. L., & Robertson, I. T. (Eds.), *International Review of Industrial and Organizational Psychology* (pp. 317–372). New York, NY: Wiley.

Deutsch, M. (1985). *Distributive justice: A social psychological perspective.* New Haven, CT: Yale University Press.

Duarte, D. L. and Snyder, N. T. (1999). Mastering virtual teams: Strategies, tools, and techniques that succeed. San Francisco, CA: Jossey-Bass.

Dutton, J. E., Dukerich, J. M. and Harquail, C. V. (1994). Organizational images and member identification. *Administrative Science Quarterly*, 39, 239–263.

Fiol, C. M. and O'Connor, E. J. (2005). Identification in face-to-face, hybrid and pure virtual teams: Untangling the contradictions. *Organization Science*, 16, 19–32.

Folger, R. and Cropanzano, R. (1998). *Organizational Justice and Human Resource Management*. Thousand Oaks, CA: Sage.

Gibson, C. B. and Cohen, S. G. (Eds.). (2003). *Virtual teams that work. Creating conditions for virtual team effectiveness.* San Francisco, CA: Jossey-Bass.

Greenberg, J. (1993). The social side of fairness: Interpersonal and informational classes of organizational justice. In R. Cropanzano (Ed.), *Justice in the workplace: Approaching fairness in human resource management* (pp. 79–103). Hillsdale, NJ: Lawrence Erlbaum Associates.

Greenberg, J. and Cropanzano, R. (2001). *Advances in organizational justice.* Stanford, CA: Stanford University Press.

Griffith, T. L. and 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.

Haslam, S. A. (2001). *Psychology in organizations: The social identity approach.* Newbury Park, CA: Sage.

Hertel, G., Konradt, U. and Orlikowski, B. (2004). Managing distance by interdependence: Goal setting, task interdependence, and team-based rewards in virtual teams. *European Journal of Work and Organizational Psychology*, 13, 1–28.

Hertel, G., Geister, S. and Konradt, U. (2005). Managing virtual teams: A review of current empirical research. *Human Resource Management Review*, 15, 69–95.

Hinds, P. J. and Kiesler, S. (Eds.). (2002). *Distributed Work.* Cambridge, MA: MIT Press.

Hogg, M. A. and Abrams, D. (1988). *Social identifications: A social psychology of intergroup relations and group processes.* London: Routledge.

Hogg, M. A. and Terry, D. J. (2001). Social identity theory and organizational processes. In M. A. Hogg & D. J. Terry (Eds.), *Social identity processes in organizational contexts* (pp. 1–12). Philadelphia, PA: Psychology Press.

Jehn, K. A., Northcraft, G. B. and Neale, M. A. (1999). Why differences make a difference: A field study of diversity, conflict, and performance in workgroups. *Administrative Science Quarterly*, 44, 741–763.

Kirkman, B. L. and Mathieu, J. T. (2005). The dimensionality and antecedents of team virtuality. *Journal of Management*, 31, 700–718.

Kirkman, B. L., Rosen, B., Tesluk, P. E. and 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.

Leventhal, G. S. (1980). What should be done with equity theory? In K. J. Gergen, M. S. Greenberg and R. H. Willis (Eds.), *Social exchange: Advances in theory and research* (pp. 27–55). New York, NY: Plenum Press.

Liao, H. and Rupp, D. E. (2005) The impact of justice climate, climate strength, and justice orientation on work outcomes: a multilevel-multifoci framework. *Journal of Applied Psychology*, 90, 242–256.

Lind, E. A. and Tyler, T. R. (1988). *The social psychology of procedural justice.* New York: Plenum Press.

Lipponen, J., Helkama, K. and Olkkonen, M.-E. (2005). Predicting the different profiles of organizational identification: A case of shipyard subcontractors. *Journal of Occupational and Organizational Psychology*, 78, 97–112.

Lipnack, J. and Stamps, J. (2000). *Virtual teams: People working across boundaries with technology.* New York, NY: Wiley & Sons.

Mael, F. A. and 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.

Martins, L. L., Gilson, L. L. and Maynard, M. T. (2004). Virtual teams: What do we know and where do we go from here? *Journal of Management*, 30, 805–835.

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. and Hinds, P. J. (2001). Conflict and shared identity in geographically distributed teams. *The International Journal of Conflict Management*, 12, 212–238

Mortensen, M. and Hinds, P. J. (2002). Fuzzy teams: Boundary disagreement in distributed and co-located teams. In P. Hinds & S. Kiesler (Eds.), *Distributed Work.* Cambridge, MA: MIT Press.

Polzer, J. T., Crisp, C. P., Jarvenpaa, S. L. and Kim, J. W. (2006). Extending the faultline model to geographically dispersed teams: How co-located subgroups can impair group functioning. *Academy of Management Journal*, 49, 679–692.

Riketta, M. (2005). Organizational identification: A meta-analysis. *Journal of Vocational Behavior*, 66, 358–384.

Rometsch, M. and van Rekom, J. (2006). Towards a Systemic Understanding of the Tensions between Flexibility and Stability in Organizational Identity – Learning from Giddens and Luhmann. *A paper presented in EGOS Colloquium*, July 6–8th 2006, Bergen, Norway.

Tajfel, H. and 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.

Turner, J. C. (1987). *Rediscovering the social group: A self categorization theory.* New York, NY: Basil Blackwell.

Turner, J. C. (1999). Some current issues in research on social identity and self-categorization theories. In N. Ellemers, R. Spears, & B. Doosje (Eds.), *Social identity: Context, commitment, content* (pp. 6–34). Oxford, UK: Blackwell.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D. and Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory.* Oxford, UK: Blackwell.

Tyler, T. R. and Blader, S. L. (2000). *Cooperation in groups: Procedural justice, social identity and behavioral engagement.* Philadelphia, PA: Psychology Press.

Tyler, T. R. and Blader, S. L. (2001). Identity and cooperative behavior in groups. *Group Processes and Intergroup Relations*, 4, 207–226.

Tyler, T. R., Degoey, O. and Smith, H. (1996). Understanding why the justice of group procedures matters: A test of the psychological dynamics of the group-value model. *Journal of Personality and Social Psychology*, 70, 913–930.

Tyler, T. R. and Lind, E. A. (1992). A relational model of authority in groups. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 25, pp. 115–191). New York, NY: Academic.

Van Knippenberg, D. and van Schie, E. C. M. (2000). Foci and correlates of organizational identification. *Journal of Occupational and Organizational Psychology*, 73, 137–147.

Vartiainen, M. (2006). Mobile virtual work – concepts, outcomes and challenges. In Andriessen, E. & Vartiainen, M. (Eds.), *Mobile Virtual Work: A New Paradigm?* (pp. 13–44). Heidelberg: Springer.

Wiesenfeld, B. M., Raghurum, S. and Garud, R. (1999). Communication patterns as determinants of organizational identification in a virtual organization. *Organization Science*, 10, 777–790.

Williams, K. Y. and O'Reilly, C. A. (1998). Demography and diversity in organizations. In B. Staw & R. Sutton (Eds.), *Research in Organizational Behavior.* (Vol. 20, pp. 77–140). Stamford, CT: JAI Press.

ABSTRACT

The importance of virtual team (VT) identification for the success of the team is widely recognized in literature. However, the antecedents of identification in virtual teams have remained understudied thus far. This study aims at filling this gap by examining how identification with VTs is related to structural factors such as the degree of virtuality, team size, cultural diversity and team tenure, and to organizational justice. It is hypothesized that organizational justice and team tenure are positively related to identification, whereas the degree of virtuality, team size and cultural diversity have a negative relationship with identification. These hypotheses were tested on a sample of 91 virtual team members. The results revealed that, as predicted, organizational justice had a strong positive relation to virtual team identification. However, contrary to the expectations, the structural factors were not related to identification. The results and their implications are discussed in terms of virtual team literature.

Marko Hakonen, M.Soc.Sc., is a researcher at the Laboratory of Work Psychology and Leadership at Helsinki University of Technology, Finland. He is finalizing his PhD on identity, justice perceptions and trust in virtual teams.

Satu Koivisto, M.Soc.Sc. and PhD student, is a researcher at the Laboratory of Work Psychology and Leadership at Helsinki University of Technology, Finland. Her main fields of interest are group dynamics, leadership and identification in virtual and mobile teams.