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The Intergroup Aspect of Organizational Workgroups: The Role of Group Support Systems

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Abstract

In this study, we explore the supporting role of group support systems (GSS) in organizational workgroups that involve groups of distinct social identities. Intergroup processes become relevant and prevalent in such workgroups and trigger new issues. Anonymity is an important feature of GSS concerning the social influence in such intergroup setting whereby it not only shields individual participants' identities, but also the corresponding groups' identities. We report on the results of an experiment consisting of 20 workgroups. Results show that the anonymity feature of GSS reduces subjective uncertainty and conformity, increases minority satisfaction, and improves decision quality. The enforcement of common fate and its impact on social influence are also examined. Our findings provide preliminary indication of the usefulness of GSS in intergroup settings of organizational workgroups.

Keywords: Workgroup, intergroup, group support systems, anonymity, common fate

1. Introduction

The emergence and spread of team working and team-based organizations has been seen to be a principal characteristic of the world of work in the 1980s and 1990s (West 1996). The characteristic is ever expanding with new organizational forms (e.g., virtual and networked organizations) which arise in response to social and technological advances (Fulk and DeSanctis 1995). Different groups need to work together on certain projects (e.g., strategic planning for the organization). Meetings of different groups conducted electronically or otherwise, are considered commonplace. Intergroup processes become relevant and prevalent as groups of distinct social identities gather and interact, which triggers issues that warrant separate treatment from prior studies. In particular, the intervention of technologies with these issues and its consequences constitutes the research question in this paper. We will look specifically into group support systems

(GSS) which have been pursued by researchers for decades.

GSS are designed to facilitate interaction and foster collaboration and decision making within groups. They accomplish this purpose by providing group members with a set of features that aim to increase process gains (e.g., "learning" and "objective evaluation") and reduce process losses (e.g., "conformance pressure" and "evaluation apprehension") (Nunamaker et al. 1991). Although not all theoretical treatments of GSS have agreed upon a single list of "essential features", anonymity has been recognized by many researchers to play a key role in producing effects (see Klein et al. 2003 for a comprehensive review). While the feature of anonymity has been examined in single-group contexts, there is relatively little or no knowledge of how it will affect *intergroup* interaction. How the anonymity feature of GSS may affect social influence in an intergroup setting is an important question that must be looked at (Lim 1996).

This paper proposes a theoretical framework interrelating three concepts: anonymity, intergroup, and influence. Hypotheses derived from this model were tested with an experiment. The paper is organized as follows. Section 2 reviews the literature pertaining to the intergroup setting. Section 3 presents our research model and hypotheses. The research method is described in Section 4. Section 5 reports the experimental results, followed by a discussion of the findings in Section 6. Section 7 concludes this study with future research opportunities highlighted.

2. The Intergroup Setting

GSS have been defined as combining "communication, computer, and decision technologies to support problem formulation and solution in group meetings" (DeSanctis and Gallupe 1987, p. 589). Much work has been done on GSS addressing various aspects. These include four major categories of variables: contextual or independent variables (e.g., characteristics of the GSS being used, of the group, task, environmental, and organizational contexts), intervening variables (e.g., session length, number of sessions, and presence and role of a facilitator), group adaptation processes (e.g., their level of effort, their attitude toward the GSS, and participation patterns), and outcomes (e.g., efficiency measures such as calendar time to decision, effectiveness measures such as decision quality, usability of the system and methods used, and subjective satisfaction measures) (see Fjermestad and Hiltz 1999 for a comprehensive and integrative review).

However, an important phenomenon as regards small group research that deserves attention is intergroup setting. Most past GSS studies have examined the impact of GSS (or their features) on decision-making in a setting defined by a small group isolated from all other social groups. This approach is appropriate when the field was in an early stage of development. As the complexity of GSS studies keeps increasing, it would be imperative to introduce a more encompassing context. Consistent with this view, the proposed study provides an intergroup environment in which two groups of distinct identities make a decision together using GSS. Accordingly, we shall use the term "workgroup" to refer to the assembly of all meeting participants, and "group" to refer to each smaller assembly defined by the relevant identity.

As far as intergroup literature is concerned, self-categorization theory (SCT) probably represents the most established line of research. SCT is a set of related assumptions and hypotheses about the functioning of the social self-concept – the concept of self based on comparison with other people and relevant to social interaction. This theory grew out of the research on social identity. Social identity is defined as "the individual's knowledge that he (she) belongs to certain social groups together with some emotional and value significance to him (her) of the group membership" (Turner and Oakes 1989, p. 234). Much empirical evidence has attested to the validity of SCT.

A central idea of SCT states that factors which enhance the salience of ingroup-outgroup categorizations tend to increase the perceived identity between self and ingroup members (and the difference from outgroup members) and so **depersonalize** individual self-perception on the stereotypical dimensions which define the relevant ingroup membership. Depersonalization refers to the process of "self-stereotyping" whereby people come to perceive themselves more as the interchangeable exemplars of a social category than as unique personalities defined by their individual differences from others. SCT argues that depersonalization of self-perception is the basic process underlying group phenomena including group cohesiveness, subjective uncertainty, and social influence processes.

SCT provides an explanation for social influence that emphasizes the social identities of the sources and target of influence (Turner 1987, 1991; Turner and Oakes 1989). The Social Identity Model of Deindividuation Effects (SIDE) (Reicher et al. 1995) builds on SCT and tries to extend it to provide a more detailed analysis of the effects of situational factors such as anonymity on social influence processes.

The SIDE model suggests that when social identity is salient – that is, when people define themselves as group members rather than as individuals – the anonymity of the members would decrease attention regarding interpersonal differences and enhance the salience of the group and social identity. Such situations would result in a greater adherence to the group norms and greater group influence. However, this model also points out that when personal identity is salient, anonymity would not promote normative responses, but rather it would encourage personal and individual responses (Reicher et al. 1995; Spears and Lea 1992, 1994).

According to SCT, group cohesion is produced and increased by factors which lead to the formation and salience of shared ingroup memberships. Supportive evidence (see Lott and Lott 1965) shows that common fate and explicit group membership is probably the most powerful determinant of cohesion yet identified. Common fate has been defined as representing "a coincidence of outcomes among two or more persons that arises because they have been subjected to the same external forces or decision rules" (Brewer 2000, p. 118). Lewin (1948) and Campbell (1958) saw common fate (or "interdependence of fate") to be a critical precondition for groups to become real, in a psychological sense.

Subjective validity (Festinger 1950; Kelly 1967), one's confidence in the objective validity of one's opinions and beliefs, is a direct function of the extent to which similar

people (in relevant respects) in the same stimulus situation are perceived, expected, or believed to agree with one's own response. Conversely, **subjective uncertainty**, a condition leading to social influence, is a direct function of the extent to which **similar others** are not perceived or believed to respond similarly to oneself in the same stimulus situation. The negative feelings associated with uncertainty may be mitigated by conforming to the majority.

The direction of effective influence within the group (i.e., who successfully influences whom) is a function of the relative persuasiveness of the members, which is based on the degree of relative consensual support for a member. In other words, other things being equal, majority opinion prevails. The perception of others as an appropriate reference group creates the shared expectations of agreement necessary for the arousal of uncertainty and mutual influence (Alexander et al. 1970). An individual who holds minority view in his social category will experience uncertainty because he disagrees with people categorized as identical to him (i.e., the majority) (see Hogg and Abrams 1993). Moreover, such uncertainty need not be lessened even if his view is shared by members of a **different** social category, as they are not categorized as identical to himself. If anything, sharing opinions with people of a different social category may even **increase** the minority's uncertainty, thereby reinforcing the majority's influence.

3. Research Model and Hypotheses

Taking subjective uncertainty and conformity as the dependent variables and using the SCT concepts deliberated in the previous section, the research model is put forward (Figure 1).

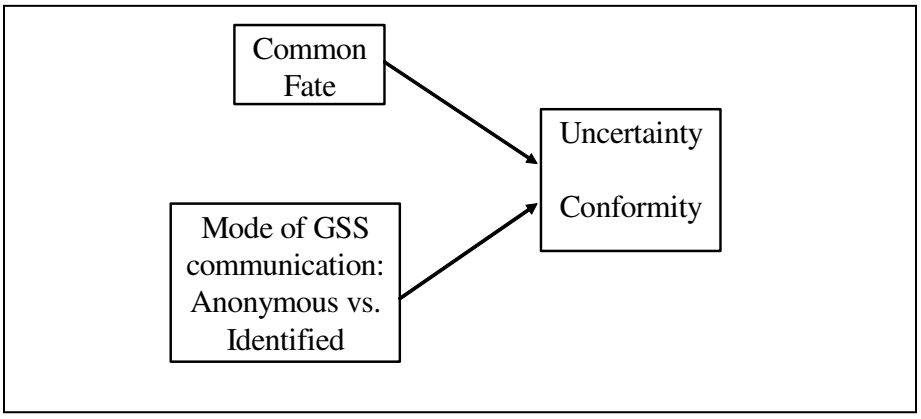

FIGURE 1: Research Model

Hypotheses 1 and 2 address the relationship between common fate and salient aspects of intergroup relations with respect to the minority. An individual perceives his own image or esteem through his association, or membership, with a social group. A group derives its social identity through perceived differences with other groups, as well as the perceived similarities within the group. Campbell (1958) suggested that common fate is the dominant factor in establishing group boundaries (i.e., differentiating between the ingroup and the outgroups). Members in groups with high common fate perceive themselves to be highly similar to each other in terms of goals and membership (Lott and

Lott 1965). In particular, they will actively seek social agreement, or subjectively correct perception, with other group members – people categorized as similar to self (Hogg and Abrams 1993). Therefore, when a minority in a high common fate group disagrees with the majority, he or she will experience subjective uncertainty (Turner 1987). Subjective uncertainty refers to the lack of confidence in the objective validity of one's beliefs, opinions, etc. (Hogg and Abrams 1993). To mitigate uncertainty, he will in turn conform to the majority's views (Lim 1996). In other words, he or she will comply with the ingroup's attitudes, opinions, beliefs, and behaviors.

Hypothesis 1: Greater minority uncertainty will be exhibited when common fate for a group is high than low.

Hypothesis 2: Greater minority conformity will be exhibited when common fate for a group is high than low.

Hypotheses 3 to 4 address the relationship between mode of GSS communication (anonymous versus identified) and salient aspects of intergroup relations with respect to the minority. Turner and Oakes (1989, p. 234) stated that part of an individual's self-concept derives from his membership in social groups, which encompasses the value and emotional significance attached to it. Hence, people actively pursue membership and subjective social agreement in groups; when a group member disagrees with his ingroup's majority openly (i.e., under identified communication), he risks being chastised and considered an outcast. This in turn leads him to experience subjective uncertainty. To avoid this uncertainty, the minority conforms to the majority. However, anonymity in the intergroup context obscures not only the individual identities but also identities of the groups. Since group members are not able to associate views with their originators, the endorsement for social intragroup agreement becomes irrelevant or unnecessary. Therefore, when anonymous minorities voice contrasting views, they experience less or no uncertainty. Subsequently, anonymity may insulate group members from the conformance pressures that accompany group interaction (Asch 1951; Milgram 1977), resulting in lower minority conformity.

Hypothesis 3: Greater minority uncertainty will be exhibited with **identified** communication than with **anonymous** communication.

Hypothesis 4: Greater minority conformity will be exhibited with **identified** communication than with **anonymous** communication.

Anonymity has been identified as one of the major determinants affecting decision processes and outcomes in GSS research (see Klein et al. 2003 for a review). Experimental studies on GSS have generally found that anonymity leads to an increase in production and critical thought (e.g., Connolly et al. 1990; Gallupe et al. 1997; Jessup et al. 1990; Jessup and Tansik 1991; McLeod 1992). It allows individual group members to be less inhibited in their expression of ideas (El-Shinnawy and Vinze 1997). In addition, criticisms of others' contributions will not be met with threat of direct repercussions (Valacich et al. 1992). Process losses, such as evaluation apprehension, member domination, conformance pressure and status competition, are removed or reduced (Nunamaker et al. 1991; Pinsonneault and Kraemer 1990). Therefore, anonymity will be

particularly beneficial to the minority, encouraging him or her to voice out opposing views. Thus, anonymous minorities will experience higher satisfaction than identified minorities. Moreover, anonymity promotes task focus, encouraging members to focus on ideas, regardless of who generated them (Hayne et al. 1994), and providing an environment conducive to critical rather than supportive behavior (Jessup and Tansik 1991). Subsequently, exploration of alternatives and surfacing of assumptions increases (Hayne and Rice 1997; Hayne et al. 1994), which will, in turn, produce decisions with high qualities. Thus, we derive the following two hypotheses:

Hypothesis 5: Lower minority satisfaction with decision process will be experienced with **identified** communication than with **anonymous** communication.

Hypothesis 6: Lower decision quality will be produced with **identified** communication than with **anonymous** communication.

4. Research Method

4.1 Research Design and Subjects

A laboratory experiment with a 2 x 2 factorial design was conducted to test the hypotheses. The independent variables are common fate (high versus low) and mode of GSS communication (anonymous versus identified), resulting in four conditions. Each condition was assigned five workgroups.

One hundred and twenty undergraduate students from a large university served as subjects in the experiment. Each experimental session involved six subjects who were randomly assigned to two groups (with three members each), being the "Advisory Committee" and the "Board of Directors" (see the "TASK" section for explanations).

A level-1 group support system was used for this experiment (see DeSanctis and Gallupe 1987). By definition, level-1 GSS are communication media aimed at improving the decision process by removing common communication barriers and facilitating information exchange among members (DeSanctis and Gallupe 1987). Its features include a public screen for instantaneous display of ideas, anonymous input of ideas and electronic message exchange between members.

4.2 Task

A strategic planning case from Whetten and Cameron (1984) was used. The task revolved around Tidewater College, which was described to be situated in a rural mountain area and founded by the local church. With an annual enrolment of 450 students, Tidewater College provided an opportunity for the local residents to obtain a college education, focusing on liberal arts and teacher preparation. However, the 1960s' baby boom brought an insurge of students, which greatly overextended the faculty teaching loads. Encouraged by such overwhelming enrolment, the former college president invested heavily in new facilities to accommodate the sudden inadequacies. Funding for the new facilities was supported by the government, on the condition that the college offered several new programs. Unfortunately, the college was soon saddled with multiple

problems, including dwindling enrolment, financial problems, bad reputation and low morale. The inability of the college to repay its debt, as well as its incompetence to complete certain government programs, amplified its dismaying predicament.

The subjects were informed that the previous president of the college had resigned in despair. The new president had assigned them, members of the Advisory Committee or Directors' Board, to solve these grappling problems together.

4.3 Experimental Procedure

Upon arriving for the study, subjects were informed of their respective groups (i.e., Advisory Committee or Board of Directors) by the experimenter, and led into the first stage of the study. This consisted of a ten-minute warm-up discussion about a topic totally independent from the actual experimental discussion topic. The purpose of this warm-up discussion was to enable the subjects to become more accustomed to the environment, and to each other. After the topic sheets were handed out, the subjects discussed the warm-up task and came up with a workgroup consensus ranking. At the end of this discussion, the subjects underwent a brief training session on how to use the system.

Subsequently, the experimenter handed out the description of the problem. Before the subjects commenced on the actual discussion topic, the experimenter informed the workgroup that their ultimate goal was to come up with a single coherent recommendation on how to solve the problem. In addition, the workgroup was told that they were given 45 minutes to come up with the solution. For the anonymity condition, subjects were logged into the system with similar-looking user identification names. They were also told not to reveal their identities to other parties during the entire course of the discussion. Subjects in the identified condition were logged into the system with identification names specifying distinctly the group they belonged to. Common fate was manipulated using a reward mechanism. Subjects in the low common fate cell were informed that their performance would be evaluated based on the quality of their individual contribution to the final outcome. Subjects in the high common fate cell, on the other hand, were informed that their performance would be evaluated based on the quality of their group's contribution to the final outcome. A number of studies have shown that groups governed by such reward structures tend to work together more cooperatively and productively than when individuals within groups are rewarded differentially (e.g., Worchel et al. 1998).

The subjects were informed that they, as members of the Advisory Committee or the Board of Directors, have to tackle the college's problems together with the other group. The workgroup then proceeded to solve the problems with all members interact via the group support system. When the workgroup had reached a solution, they recorded it on the answer sheet provided. Then they were administered a questionnaire adapted from Green and Taber (1980) to measure the workgroup members' satisfaction levels. After that, the experimenter thanked the subjects for their participation and dismissed them from the experiment.

4.4 Measurement of Dependent Variables

Determination of minority: Subjects were asked to what extent they perceived themselves to be minorities of their ingroups. The ratings of their answers were summed up and the highest score for each group was taken to be the minority's. Minority variables' (i.e., minority uncertainty, conformity and satisfaction with decision process) measurements were correspondingly derived.

Minority uncertainty: The degree of minority's uncertainty was measured using the following questions: (a) the degree of confidence with own views: not at all/to a large extent; (b) the degree of uncertainty during the discussion: not at all/to a large extent; (c) the degree of perceptions of correctness of own views: not at all/to a large extent. These items were measured using a rating continuum with five intervals.

Minority conformity: The degree of minority's conformity was measured using the following two questions: (a) the frequency of conforming to ingroup: not at all/to a large extent; (b) the degree of conformity to ingroup: not at all/to a large extent. These items were measured using a rating continuum with five intervals.

Minority satisfaction with decision process: Questions from Green and Taber (1980) were adapted to measure the minority's level of satisfaction with the decision process.

Decision quality: The solution on the answer sheets was evaluated by two independent raters. Each solution was graded on its effectiveness, feasibility, creativity, significance, and competence, similar to the five rating criteria in Leathers' Productivity Rating Instrument (PRI) (Leathers 1972), and rated on a scale of zero to ten. For decisions consisting of more than one "action", each action was rated using the rating criteria as stated above; subsequently, such ratings for each workgroup were summed up and averaged.

5. Results

As we are only analyzing the data of the minority, the effective sample size is relatively small. Hence, we shall use p = 0.10 as the significance level for the data analysis.

5.1 Minority Uncertainty

ANOVA showed a main effect due to anonymity (F = 3.84; p = 0.06) (see Table 1). Minorities under the anonymous condition experienced lower uncertainties (mean = 6.54, s.d. = 1.81) than their counterparts under the identified condition (mean = 7.71, s.d. = 2.61).

In addition, there was also a main effect due to common fate (F = 4.07; p = 0.06) (see Table 1). Minorities in high common fate groups experienced higher uncertainties (mean = 7.92, s.d. = 2.50) than minorities in low common fate groups (mean = 6.53, s.d. = 2.00).

TABLE 1: ANOVA Table for Degree of Uncertainty

SOURCE	*SUM-OF-SQUARES*	*DF*	*MEAN-SQUARE*	*F-*

RATIO	*P*				
ANONYMITY	16.70	1	16.70	3.84	0.06
COMMON FATE	17.70	1	17.70	4.07	0.06
ANONYMITY*COMMON FATE	10.50	1	10.50	2.42	0.13
ERROR	99.96	23	4.35		

5.2 Minority Conformity

ANOVA showed a main effect due to anonymity (F = 3.77; p = 0.07) (see Table 2). Minorities under the anonymous condition conformed less to their ingroup (mean = 5.77, s.d. = 1.42) than their counterparts under the identified condition (mean = 6.86, s.d. = 1.92).

TABLE 2: ANOVA Table for Degree of Conformity

SOURCE	*SUM-OF-SQUARES*	*DF*	*MEAN-SQUARE*	*F-RATIO*	*P*
ANONYMITY	10.38	1	10.38	3.77	0.07
COMMON FATE	0.86	1	0.86	0.31	0.58
ANONYMITY*COMMON FATE	7.83	1	7.83	2.84	0.11
ERROR	63.35	23	2.75		

5.3 Minority Satisfaction with Decision Process

ANOVA showed a main effect due to anonymity (F = 3.66; p = 0.07) (see Table 3). Minorities under the anonymous condition were more satisfied (mean = 16.62, s.d. = 2.84) as compared to minorities under the identified condition (mean = 13.86, s.d. = 5.29).

TABLE 3: ANOVA Table for Satisfaction with Decision Process

SOURCE	*SUM-OF-SQUARES*	*DF*	*MEAN-SQUARE*	*F-RATIO*	*P*
ANONYMITY	67.78	1	67.78	3.66	0.07
COMMON FATE	24.69	1	24.69	1.33	0.26
ANONYMITY*COMMON FATE	9.96	1	9.96	0.54	0.47
ERROR	426.23	23	18.53		

5.4 Decision Quality

ANOVA indicated that anonymous workgroups (mean = 8.08; s.d. = 0.67) achieved higher decision quality than identified workgroups (mean = 7.40; s.d. = 0.51) (F = 6.34; p = 0.02) (see Table 4).

TABLE 4: ANOVA Table for Decision Quality

SOURCE	*SUM-OF-SQUARES*	*DF*	*MEAN-SQUARE*	*F-RATIO*	*P*
ANONYMITY	2.37	1	2.37	6.34	0.02
COMMON FATE	0.40	1	0.40	1.07	0.32
ANONYMITY*COMMON FATE	0.02	1	0.02	0.06	0.80
ERROR	5.98	16	0.37		

Table 5 summarizes the experimental results with respect to the hypotheses proposed earlier.

TABLE 5: Summary of Hypotheses versus Experimental Results

	Hypothesis	*Supported ?*
1	Greater minority uncertainty will be exhibited when common fate for a group is high than low.	Yes
2	Greater minority conformity will be exhibited when common fate for a group is high than low.	No
3	Greater minority uncertainty will be exhibited with identified communication than with anonymous communication.	Yes
4	Greater minority conformity will be exhibited with identified communication than with anonymous communication.	Yes
5	Lower minority satisfaction with decision process will be experienced with identified communication than with anonymous communication.	Yes
6	Lower decision quality will be produced with identified communication than with anonymous communication.	Yes

6. Discussions and Implications

6.1 Common Fate

Experimental results indicated that minorities in high common fate groups experienced greater uncertainty than those in low common fate groups. This is consistent with our hypothesis. Hogg and Abrams (1993) suggested that it is fundamentally important for individuals to be confident and certain about the correctness and validity of their perceptions, attitudes and behaviors; accordingly, subjective uncertainty is a poor basis for functional conduct, and individuals need to be assured that they understand and agree with others who share the same group memberships. Hence, the defining and prescriptive attributes of a group, or the group standard or norm, are defined from perceived intragroup similarities and intergroup differences. Internalized by group members

through the process of self-categorization, this standard enhances self-perception, and reduces subjective uncertainty. In a group with high common fate, group members perceive themselves to be very similar to others in the same group. As a result, the strong bonding among group members induces them to actively seek intragroup consensus; when a group member discovers that he disagrees with other members of his own group (i.e., he belongs to the minority), subjective uncertainty emerges.

ANOVA results indicate that there is no main effect on conformity due to common fate. However, a marginally significant interaction on conformity is present ($F = 2.84$; $p = 0.11$). A further exploration was conducted into the apparent moderating effect of anonymity on the relationship between common fate and conformity. T-test results reveal that under identified condition, minorities from high common fate groups exhibited marginally greater conformity (mean = 8.00; s.d. = 1.58) than minorities from low common fate groups (mean = 6.33; s.d. = 1.80) ($t = 1.73$; $p = 0.11$). Thus, the hypothesis that minorities from high common fate groups would exhibit greater conformity than their counterparts in low common fate groups appears to be supported under identified communication. In groups where communication is identified and common fate is high, intragroup cohesion and cooperation become top priorities and accentuate the pressure to conform. When minorities from these groups voice opposing views, their identities are known and they risk exclusion from the group. As a result, conformity to the majority's judgement is advocated and any deviation from the group consensus is discouraged. This is consistent with Asch's (1951) study on group pressure, which reveals that subjects generally conformed because of "social" reasons such as the fear of group exclusion. On the other hand, the degree of conformity exhibited by minorities from both high and low common fate groups was insignificant when communication is anonymous. Anonymity obscures the groups and provides a shield for minorities' identities; it assures minorities that their identities will not be known and hence, deviation will not be punished. Consequently, the pressure to conform evaporates as maintenance of group harmony becomes less of an issue.

6.2 Anonymity

Results showed that minorities under the identified condition experienced more uncertainty and conformed more to the ingroup majority than their counterparts under the anonymous condition. In addition, they (identified minorities) also experienced lower satisfaction with decision process. Under identified communication, members' identities are known to the others. Therefore, when a member's opinions deviate from those of the ingroup majority, he or she experiences subjective uncertainty. As a result, to avoid being rebutted or being cast as the "outsider", the minority member conforms to the majority's views. However, under anonymous conditions, the groups become obscure as the identities of group members are not revealed. Thus, social identity personalizes to self identity. Since group members are not able to associate views with their originators, the endorsement for social intragroup agreement becomes irrelevant or unnecessary. Thus, a minority member experiences a lesser degree of uncertainty. Moreover, since the anonymity feature acts as a protective shield for the deviant's identity, the fear of being singled out by others is eliminated. Thus, the minority could voice unpopular and opposing views without fear of being admonished by his ingroup members. Hence, the

pressure to comply lessens and the minority conforms less under anonymous conditions. The findings on minority uncertainty and conformity are consistent with the SIDE model, which points out that when personal identity is salient, anonymity would not promote normative responses, but rather it would encourage personal and individual responses. Correspondingly, minorities become less apprehensive and more involved in the group problem-solving process, resulting in higher satisfaction. This is consistent with several GSS studies, which found that anonymity increases satisfaction (e.g., Dennis et al. 1990a, 1990b; George et al. 1990; Nunamaker et al. 1987, 1988, and 1989).

Decision quality was better for anonymous workgroups than for identified workgroups. Process losses, such as conformance pressure and evaluation apprehension, lead to inadequate information search and evaluation, resulting in inferior decisions (Nunamaker et al. 1993; Steiner 1972). Nunamaker et al. (1993) proposed that anonymity reduces or eliminates evaluation apprehension and conformance pressure. Thus, shy members are encouraged to speak up and criticise without repercussions or reprisals, inadvertently encouraging task participation and increasing process gains by catching errors (Nunamaker et al. 1993). As a result, more creative and critical suggestions are generated. Moreover, without the knowledge of contributors' identities, the worth of contributions, and not the contributor, is appraised and judged objectively (Valacich et al. 1992). It is only through extensive and critical debate on the merits and demerits of a particular alternative that it can be appraised and analyzed thoroughly; complacency in exploring the feasibility of an alternative may well result in an inferior solution. Hence, anonymity produces better decision quality.

7. Concluding Remarks

This paper has presented a model as well as empirical findings concerning the impact of anonymity, an integral component of GSS, on influence-related variables including uncertainty and conformity. It provides a starting point for the examination of issues related to the intergroup setting, a much neglected aspect in GSS research, yet one which is increasingly important arising from the emphasis on globalization and new organizational forms. Teams can work together virtually (thus termed "virtual teams"), using GSS to work distributed in time and space over the Internet (Dennis and Wixom 2002). Distributed virtual work significantly reduces traditional verbal and visual communication, forcing groups to rely more on the electronic communication provided by the GSS. The intergroup setting is prominent for virtual teams as they are characterized by the combination of geographic dispersion of team members, disciplinary heterogeneity and different organizational affiliations (Majchrzak et al. 2000). Therefore, the findings of this paper are likely to be generalized to virtual teams with meticulous justifications.

The paper, limited in certain aspects, calls for future research in various directions. Firstly, unlike organizational workgroups which usually take more than one meeting to reach a decision, each workgroup had only 45 minutes to reach a consensus. Such short period may not fully bring out the behaviors of workgroups in organizations. Therefore, future research of a longitudinal nature is warranted. Secondly, taking an exploratory step on the topic, this study used three-member groups; as the majority-versus-minority demarcation

may become more pronounced in larger groups, group size should be a factor to be examined in future research. Similarly, the number of groups interacting is another factor that deserves further investigation. Thirdly, cultural factor concerning organizational workgroups is important to consider in light of culture's consequences for social influence (e.g., minority uncertainty and conformity) (see Hofstede 1980). Lastly, this study has focused on the communication feature of GSS. Other features, especially those of level-2 and level-3 GSS (DeSanctis and Gallupe 1987), should also be looked at in future research.

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