A Literary Examination of Electronic Meeting System Use in Everyday Organizational Life

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Abstract

This paper was motivated by imagining electronic meeting systems technology in widespread daily use in organizations. Three famous groups from popular literature are taken as case studies of dynamics common in organizational groups. By examining *The Mad Tea Party*, *Twelve Angry Men* and *The Last Supper*, the implications of EMS use for the management of these dynamics is discussed. Suggestions are offered for an agenda for the next generation of EMS research, including new metaphors for electronic meeting systems design and use.
The inspiration for this paper grew from thinking about how real groups, in their everyday context, would actually use electronic meeting technology. The groups in laboratory and most field studies are carefully briefed. But what happens in organizations once the researchers have completed their study, once the novelty of the technology fades, and groups are left on their own to incorporate these tools into their regular routines? The improbable tableaux of meetings from famous literature taking place via computer came to mind as an effective way to highlight basic issues facing organizational groups. Juxtaposing the literary and the organizational takes advantage of good literature’s ability to transcend context, and thus provides a fresh perspective on the assumptions that have guided research.

Three famous meetings will be discussed here. The first meeting will be *A Mad Tea Party*, from *Alice’s Adventures in Wonderland* by Lewis Carroll. Second will be the play, *Twelve Angry Men*, written by Reginald Rose (1955) and most famous as a movie starring Henry Fonda. The third will be the Biblical story of *The Last Supper*. For each of these meetings I will discuss the underlying group dynamics of the meeting, the organizational parallels of these dynamics and the role of electronic meeting systems in this group and others with similar dynamics. The paper will end with presenting an agenda for future work based on reconceptualization of some existing research constructs.

To set the context, I now present definitions and assumptions about three main constructs – organizationally-based groups, group meetings and electronic meeting systems. A group is defined as a collection of individuals who interact, who share a common purpose, and who are interdependent around that purpose; their interactions take place through a structure composed of norms, roles, rules and resources; there is a perceivable boundary and an identity of the collection that is recognized both by members and non-members (Alderfer, 1977; Hare, 1976). The specific kind of group that is the ultimate interest here is an established task-oriented group in an organization whose members have a history of working together and expectations of continuing interactions in the future. The life of these groups spans some significant period of time – days, weeks or longer – and the work they do has significant consequences for themselves and for their organizations.

A meeting is defined here as a specific activity of organizational groups where the members assemble face-to-face at the same time and in the same location, and where information of some kind is
exchanged. The exchange can be in the form of conversation, presentation, debate, analysis, etc., and the content can range from factual data to emotional preferences (Ngwenyama & Lyttinen, in press). In the course of exchanging information, other activities may also take place such as voting on issues or assembling items. The main activity, however, is information exchange.

Electronic meeting systems (EMS) are “interactive computer-based system[s] that combine communication, computer and decision technologies to support problem formulation and solution in group meetings”, (DeSanctis & Gallupe (1987:589). The primary interest in this paper will be the form of EMS housed in an electronic decision room which typically comprises a set of networked personal computers, software that supports simultaneous access to shared files and a means to share common views of collective work (e.g., Dennis, George, Jessup, Nunamaker, & Vogel, 1988). The electronic communication is anonymous by default, though the design of these rooms does not necessarily prohibit face-to-face communication. The software provides a variety of methods to compile and display the inputs of group members. For example, some automate structured decision-making processes such as the Nominal Group Technique (Delbecq, Van de Ven & Gustafson, 1975), while others provide capabilities for shared editing (Olson & Sturrosten, 1990). Examples of specific systems include GroupSystems, developed at the University of Arizona, Software Aided Meeting Management (SAMM), developed at the University of Minnesota and the University of Michigan’s Collaboration Technology Suite (Wagner, Wynne & Mennecke 1993).

The research literature in EMS has focused on several areas (see Fjermestad & Hiltz, in press for a comprehensive review). One area is technology’s effects on aspects of group process such as the distribution of group member participation and influence (e.g., Zigurs, Poole & DeSanctis, 1988; Siegel, Dubrotsky, Kiesler & McGuire, 1986). Another focus has been technology’s effects on outcomes such as consensus formation (e.g., Watson, DeSanctis & Poole, 1988) and task accomplishment (e.g., George, Easton, Nunamaker & Northcraft, 1990; Gallupe, Bastianutti, & Cooper, 1991). Still another area has been examination of how groups actually use technology (e.g., Poole & DeSanctis, 1990; 1992). Generalizations from this research are nearly impossible because of variations in technology configurations and experimental paradigms across different groups of researchers (Hollingshead &
McGrath, 1995). One of the biggest chasms in this literature is between the findings from field studies and lab studies (Dennis, Nunamaker & Vogel, 1990; McLeod, 1992; 1996).

For example, George et al. (1990) reported that in the lab, EMS-supported groups took longer to reach consensus than did groups without this support, but in field studies researchers from this same group reported an average 55% savings of person-hours when groups used EMS compared to their past practices (Nunamaker, Dennis, Valacich, Vogel & George, 1993; Nunamaker, 1997). As another example, some lab studies have found uninhibited negative remarks ("flaming") among computer-supported groups (e.g., Siegel et al., 1986), but this type of communication has not generally been seen in the field (e.g., Hiltz, Turoff and Johnson, 1989). A final example is that lab studies have tended to find that EMS-support equalizes participation among group members (McLeod, 1992; 1996), while a field study by Kozar and Zigurs (1992) across several organizations, however, did not find this to occur.

The differences between groups in laboratory settings and groups in field settings are analogous to the famous opening line from the novel, Anna Karenina, by Leo Tolstoy (1877) — "All happy families are like one another; each unhappy family is unhappy in its own way." The groups in a typical laboratory study are like these happy families. Across all labs, experimental groups share certain essential characteristics. The definition of their task is clear, the variance among group members' understanding of the task is low, as is the variance among their demographics, the amount of group history and degree of acquaintance among the members is similar, the likelihood of interpersonal or process problems is low, and finally the members bear no consequences for their performance during the study. Field-based groups, though not necessarily unhappy, do face real problems and real consequences. Each of these groups must be understood on its own terms. The social and political environments they live in, more than technology features, may explain technology's role (Fulk, Schmitz & Steinfield, 1990).

Even the bulk of available field studies are based on finite, and frequently short, observation periods. Aside from self reported measures of satisfaction, in existing field studies of EMS little attention has been paid to internal group dynamics. The need for field studies that go beyond simple outcome measures fortunately has been recognized, and studies addressing this gap are gradually appearing (see examples in DeSanctis, Poole, Dickson & Jackson, in press; and Zigurs, DeSanctis & Billingsley, 1991).
In light of the growth in field studies of EMS, one goal of the current paper is to emphasize basic
dynamics that characterize groups in an organizational context. Laboratory groups – the source for most
of our knowledge of EMS effects – are too homogeneous and too short lived for these dynamics to have
any real effect.

For example, consider the construct of anonymity. In groups of unacquainted students taken
from a pool of hundreds, who will likely not see each other again, is there really much difference between
anonymous and non-anonymous discussion? On the other hand, if in a group of well acquainted co-
workers, we remove names from their electronic comments, will that make them anonymous? In short,
the definitions of research constructs that have been developed in the laboratory have to be reconsidered as
our research moves into the field. The current paper, therefore, challenges definitions and assumptions
that have become folklore in the EMS literature. Popular literature will be the source of data for the
analysis here. The three famous meetings to be discussed will set in relief fundamental group dynamics,
and thus help us to examine the real impacts of technology.

Dysfunctional Routines At The Mad Tea Party

"Nietzsche suggested that whereas madness is the exception in individuals, it is the rule in groups" (Janis,
1962).

It has been argued that for groups to benefit from EMS use, they must have well developed
meeting process skills and their meetings must be well planned (Bostrom, Anson & Clawson, 1993;
Bostrom, Watson & Van Over, 1992; Kozar & Zigurs, 1992; Zigurs & Kozar, 1994). But the current
research literature on EMS use has not addressed group process competence as a factor in EMS use. The
typical laboratory study uses groups observed for short time periods, and with no history together. Thus
there is virtually no variance in their process competence. Field studies involving a wider variety of
groups for longer time periods, on the other hand, provide the possibility to observe differences in process
competence. Although some of these studies have found positive effects of EMS use (e.g., Nunamaker et
al., 1993), the role of underlying group process has not been examined.
The benefits of this technology may come less from its functionality than from the careful preparation and attention to meeting process that accompanies its use. But if a group has healthy underlying processes and can run effective meetings without technology, is there much that technology can add? On the other hand can groups with serious problems, expect to use EMS effectively in the first place? Weick and Meader (1993) argued that the paradox -- EMS are effective only in well-run meetings, but well-run meetings have little need of EMS support -- must be resolved in order to justify theoretical and practical interest in EMS. In this section of the paper, I examine the implications of dysfunctions in group task processes for EMS use, with the Mad Tea Party serving as a case study to stimulate consideration of these issues. I first review the basic story, and then discuss the applications to EMS use by organizational groups.

During her journey through Wonderland Alice encounters the Mad Hatter, the March Hare and the Doormouse seated around an enormous tea table laid out for a great many people. Despite all the place settings, the three shout “no room!” as Alice approaches. We eventually discover the reason for the large number of places is that it is always the hour for tea due to an old quarrel between the Mad Hatter and his friend, Time. Thus there is never the chance “to wash the things between whiles.” Instead, the group rotates one place around the table on a cue from the Mad Hatter. The Mad Hatter leads this movement, and since they move just to the next place each time only he benefits from a fresh place. Alice joins the party nevertheless, and the Adventure begins. They offer her wine, though none is available and “more” tea, though she had had none. The Mad Hatter asks riddles to which he doesn’t know the answer, the Doormouse tries to tell a story during which he repeatedly falls asleep, and all three direct conversation toward Alice that appears both unkind and mysterious. Throughout all of this confusion, the group continues its ritual progress around the tea table. Finally, Alice leaves in a huff after being insulted one time too many. Her curiosity (and ours) about what will happen when the group gets back to the beginning of the table is never to be satisfied (Gardner, 1990).

If we try to imagine this gathering in an electronic meeting room the familiar adage, “garbage in, garbage out” springs to mind. It would not be hard to see this group trying to use the tops of the computer monitors as extra place settings, for example. Alices’ Adventure may seem an exaggerated illustration,
but commonplace are meetings with lots of busyness but no progress, where one person dominates the process while others "check out", and where unconnected monologues pass for communication. There is no shortage of mad tea parties in organizations.

The group that Alice temporarily joins is afflicted with the madness of a dysfunctional routine (Gersick & Hackman, 1990) -- one which neither helps to accomplish the task (no one actually drinks any tea at this party), nor to address the group's real problem, which is the animosity between Time and the Mad Hatter. If this group had met in an electronic decision room, would the technology have guided them out of this routine, or would it have become part of the madness? The answer depends on when technology is used, the kind of technology used and how it is used.

The extent to which groups benefit from EMS use may depend on when they use it -- when in their overall group development, and when in the course of their work. According to a model of group development developed recently by Gersick (1988; 1989; 1994) and Gersick and Hackman (1990), groups develop over time through a series of stable phases, or equilibrium states, punctuated by transitions. These stable phases can include habitual routines which Gersick and Hackman (1990) define as "when a group repeatedly exhibits a functionally similar pattern of behavior in a given stimulus situation without explicitly selecting it over alternative ways of behavior" (pg. 69). To the extent that group members do not recognize and respond to changes in the environment, these routines can become dysfunctional. Transitions represent limited windows of opportunity for change in group process to occur. The opportunities can appear when a group reaches natural milestones such as completing phases of a project, having contact with an external constituent or facing a crisis.

Gersick's work has suggested that the difference between successful and unsuccessful task completion lies, in part, on how a group manages its transition points. When groups respond to the transition with a reassessment of their task goals and working processes, they can enter subsequent phases with more effective processes. This kind of response to reaching a transition point is analogous to what others have called second-order change (Watzlawick, Weaklund & Fisch, 1974) or double-loop learning (Argyris & Schön, 1978). In contrast, groups that emerge from transitions with unchanged assumptions, structures or methods experience only first-order change (Watzlawick et al., 1974) or single-loop learning.
(Argyris & Schön, 1978). These groups respond to crises by escalating commitment to their well-known but dysfunctional course (Gladstein & Reilly, 1985; Staw, Sandelands & Dutton, 1981). Ultimately some failure in task accomplishment will result.

The Mad Tea Party's practice of rotating around their tea table is an axiomatic example of first-order change, and single-loop learning. Meetings where people vigorously pursue a dead-end or disastrous course are familiar to us all. Famous examples of this sort of group madness include groupthink (Janis, 1962) and the Abilene Paradox (Harvey, 1988). The decision to launch the space shuttle Challenger has been cited as another example of a group gone mad (Hirokawa, Gouran & Martz 1986; 1988). What these examples share in common is that none of the groups perceived that it was trapped in a vortex. Thus their poor decisions seemed inexorable. Like the Mad Hatter and his crew, these groups followed the dictates of local routines which may have been functional at one point, but that became an irrational response to current circumstances (Gersick & Hackman, 1990).

Instead of reexamining their underlying systems when faced with environmental changes, groups such as these merely rearrange the system's elements. The Mad Hatter's group moves around their table as an immediate response to the perpetual tea-time signal, without recognizing that these actions are only short-term. When the group reaches the beginning again, not only will their original problem of Time's uncooperativeness remain, but also a new problem will emerge -- no more clean places for the Mad Hatter. A successful transition would require the second-order change of repairing the relationship with Time, or perhaps the group releasing itself altogether from the obligations of this relationship.

Gersick's punctuated equilibrium model suggests that inertial phases of development are resistant to change. EMS use during these phases therefore may have less effect on preexisting processes than EMS use during transition phases. We might hypothesize that during inertial phases groups will adapt technology to fit their preexisting structures, rather than change their structures to conform to the technology's underlying philosophy. At transition points, on the other hand, groups may be receptive to the structures that the technology presents and would change their preexisting structures to conform to those structures.
The extent to which EMS may help a mad group overcome its problems may also depend on the kind of system used. DeSanctis and Gallupe (1987) presented a three level categorization system of EMS. Level 1 systems are the simplest kind, providing "technical features aimed at removing common communication barriers" (pg. 593). Level 2 systems are at a higher level of complexity, adding "decision modeling and group decision techniques aimed at reducing uncertainty" (pg. 593). Finally, the most sophisticated are Level 3 systems which add "machine-induced group communication patterns and...expert advice in the selecting and arranging of rules to be applied during a meeting" (pg. 594). McLeod and Liker (1992) present a similar classification, dividing EMS into high- and low-structure systems which they define in terms of preponderance of influence. High-structure systems are those in which the technology exerts a greater influence over a group's preexisting structures than the group exerts over technology structures. Groups using these systems adapt themselves to the technology. Low-structure systems are those in which groups exert a greater influence over the technology's structures than the technology exerts over the group's structures. Groups using these systems adapt the technology to fit themselves. The DeSanctis and Gallupe (1987) Level 2 and Level 3 EMS would be comparable to the high-structure systems described by McLeod and Liker (1992), while Level 1 EMS would be comparable to low-structure systems.

Whether a group will continue following habitual routines after starting to use EMS may depend on the extent to which the technology prevents the group from following those routines. High structure systems not only can block groups from old habits but also can provide clearly defined substitute patterns. The obtrusiveness of a high structure system might actually trigger a transition point which would then allow a group to break from an habitual and perhaps dysfunctional routine. We would thus hypothesize that high structure EMS are more likely to lead groups to second-order change than are low-structure EMS.

The final consideration here is how groups use EMS. The work of DeSanctis and Poole (1994) and Poole and DeSanctis (1990; 1992) has focused on the variations in technology usage patterns. In practice, groups actively shape their patterns of technology use, choosing which tools to incorporate and for what purposes to use them. Poole and DeSanctis (1990; 1992) have shown that groups' use of EMS
tools may or may not be consistent with the technology’s spirit—defined as the general philosophy and goals that the technology promotes. These authors have argued that factors such as group member attitudes toward technology, their skills in technology use and the quality of their interaction can affect how a group ultimately will incorporate technology into its work. They suggest further that effective task accomplishment will be more likely when groups use EMS in ways consistent with the technology’s spirit.

The foregoing discussion suggests that there is some minimum level of process competence that groups must achieve before they can gain benefit from EMS use. Technology will not create healthy processes in dysfunctional groups. A fruitful direction for future research would be how to identify this process competence floor. The dimensions would include characteristics such as group member attitudes toward participation equality, the group’s communication patterns, the preferred decision-making procedures, members’ views of their task and members’ willingness to change their working style. Groups without the requisite degree of competence would at best be able to use technology to express their madness more efficiently. They will move around their table a lot faster.

The paradox posed by Weick and Meader (1993) also implies that once a certain level of process competence is reached, the benefits gained from electronic meeting aids may be small. This would be true if we assume that the primary benefits derived from EMS use are efficiency gains. This might be analogous to people using their personal computers solely as sophisticated word processors. These users clearly gain some benefit from the PC, but the computer’s capabilities remain largely untapped. In both cases the extent to which the users perceive and pursue the greater benefits of technology will depend on their attitudes, skill levels, experience and comfort with technology. Training can play a significant role here.

In groups whose working style is already effective, training might include not only the basic functioning of technology, but also how to take advantage of the new working styles that the technology makes possible (Hiltz & Turoff, 1992). For example, EMS releases groups from the constraints of same-time, same-place meetings. In order to take best advantage of this, groups should reconsider how their work is structured and how tasks are allocated. Further, their definition of a meeting, and what meetings are meant to accomplish may also need to be reconsidered. As another example, the possibility of
anonymous and parallel communication will change previous patterns of interaction, and the process of making decisions. Learning to use these changes to advantage is part of successful technology exploitation.

One goal of future EMS research, therefore, would be to understand the potential changes in fundamental group processes that accompany technology use. Attention to the characteristics of work situations which most benefit from these changes is needed. For example, Hiltz and Turoff (1992) have argued that the asynchronous communication made possible by EMS may actually be a preferable way of working for certain kinds of tasks. Another example would be to examine the potential expansion of functions served by EMS. In a field study of EMS use by several groups, Zigurs and Kozar (1994) discovered that technology could fulfill a larger scope of roles than they had hypothesized. Particularly interesting was that users saw the technology as serving in some socio-emotional roles such as Motivator.

Thus, a way to escape from the paradox posed by Weick and Meader (1993) is to focus EMS research efforts beyond stemming process losses, and instead toward developing and understanding new group processes. At the same time, developing methods to assess a group’s readiness to benefit from technology use, beyond increasing efficiency, would be a valuable direction for research.

This discussion of the Mad Tea Party highlighted that groups must be prepared to reexamine their habitual ways of working when moving to an electronic environment. Merely sitting the technology on top of already existing processes may increase a group’s efficiency but not its effectiveness. Moreover, technology use will not resolve basic problems in group process. Given enough time, most groups will face the consequences of dysfunctional processes — they will reach the beginning of the table again — whether supported by EMS or not. An important research pursuit would be to discover those factors, both within the technology and within groups, which make the difference between perpetuating existing habits, and seeking effective new ways of working. A practical consideration then would be teaching these factors to EMS users.

Social Influence In Twelve Angry Men

In this play, a jury deliberates over the evidence presented in the trial of a 19 year old boy accused of murdering his father. The verdict must be unanimous, and a guilty verdict would bring a
mandatory death sentence. Their deliberations begin with a show-of-hands vote which results in 11 votes for guilty and 1 for not guilty. Under the influence of the 8th juror, who never changes his initial not-guilty vote, the other jurors eventually change their votes to not guilty. The play ends as the jurors return to the courtroom to render their unanimous not-guilty verdict.

The 8th juror is the central character, and the drama of the play lies in the conflict between him and the others. In considering the question of what would have happened if this meeting had taken place in an electronic decision room, it is therefore useful to focus on the 8th juror’s role. The disagreement in the group seemed to be that 8th juror believed the boy to be innocent while the remaining jurors believed the boy to be a murderer. This however was not the real problem; the group faced the more serious problem that the members disagreed on what task they were to perform. What is more, the task definition assumed by the eleven jurors in the initial majority was wrong. Only the 8th juror recognized correctly that the group’s true task was not to decide if the defendant had committed the crime. Rather, the task was to assess whether there could be any reasonable doubts about the evidence presented by the prosecution. While the other jurors busied themselves in vain with the question — did the boy kill his father? — the 8th juror focused on the real work of questioning the prosecution’s case.

The 8th juror’s objective was to get the group members working together on the right task. This involved him persuading the others of the value of examining carefully the evidence presented against the defendant. The job he set for himself was a difficult one. It was clear that the jurors had already made up their minds before deliberations began (3rd Juror: “It’s pretty tough to figure isn’t it? A kid kills his father... Just like that”). They were unwilling to discuss the evidence any further for reasons ranging from callous expedience, (7th Juror: “This better be fast. I got tickets to the ballgame...”), to rabid bigotry (10th Juror: “...this boy on trial here. We’ve got him. I say get him before his kind gets us.”). Further, they did not believe that discussion would make any difference (7th Juror: “Well, what’s there to talk about? Eleven men here agree. Nobody had to think twice about it, except you.”; 10th Juror: “We don’t owe him a thing. He got a fair trial, didn’t he?!”). Added to this, it was the hottest day of the year, and the fan in the room was not working. One juror tried to tell dirty jokes as a way to avoid discussing the case, while another started a game of tic-tac-toe. How then did the 8th juror persuade the others to discuss
the case, resulting in the improbable outcome of them all changing their votes? How would an electronic meeting environment have affected this outcome?

The likelihood that a persuasive message will produce attitude change depends on the characteristics of the message itself and on the characteristics of the messenger (Petty & Cacioppo, 1981). Within the specific context of group discussion, the two mechanisms for producing opinion change are persuasive arguments and social comparisons (Burnstein & Vinokur, 1977; Cotton & Baron, 1980; Laughlin & Earley, 1982; Sanders & Baron, 1977; Zuber, Crott & Werner, 1992). According to persuasive arguments theory, group members will change their opinions if they hear in discussion valid arguments which had not occurred to them previously (Burnstein & Vinokur, 1977). In Twelve Angry Men, the majority of 11 jurors had not thought to question the prosecuting attorney's arguments, and thus the 8th juror tried to raise those questions for them, stating that "I had questions I would have liked to ask...I started to feel that the defence counsel wasn't very competent...He let too many things go..."

Under the social comparison mechanism of opinion change, group members compare themselves to others along some dimension of social desirability, such as compassion or intelligence. To the extent that their pre-discussion opinions place them away from the group average on that dimension, they will be motivated to shift their opinions toward the average (Cotton & Baron, 1980; Sanders & Baron, 1977). In addition, group members will be persuaded by people whom they judge favorably along the given dimension (Brown, 1986). Rose, the playwright, has included an intuitive understanding of this process into the drama, as illustrated by the following exchange:

4th juror: ...Gentlemen, this case is based on a reasonable and logical
progression of facts. Let's keep it there.

11th juror: Facts may be coloured by the personalities of the people
who present them.

A third mechanism for opinion change also functioned in this case. The 8th juror's status as a minority opinion holder added to the persuasive effect of his arguments. His role represented a textbook case of minority influence (Nemeth, 1986). Minorities who persistently express deviant opinions in discussion can lead a group to more accurate and creative decisions (Nemeth, 1986; Moscovici, 1985),
even if the minority opinion does not actually prevail. This occurs because exposure to deviant opinions, expressed with confidence and persistence, increases cognitive arousal and stimulates divergent thinking (Nemeth, 1986; Mackie, 1987). This results in more thorough problem analysis and solution search, which in turn lead to high quality decisions. Another effect of exposure to minority opinions frequently is private opinion change among group members in the majority (Wood, Lundgren, Ouellette, Busceme & Blackstone, 1994; Maass & Clark, 1984; Mackie, 1987).

The 8th juror was confident that voting not-guilty was the correct action, until the group could eliminate reasonable doubts about the evidence. He held onto this confidence despite the overwhelming and hostile disagreement of his fellow jurors at the start. His insistence forced the group to consider a broader and more careful view of the trial evidence than they were initially inclined to do. Once this process was set into motion, the other jurors carried it forward, with some of them eventually raising their own arguments for the not-guilty verdict. The other jurors were thus able to come to the conclusion for themselves that not-guilty was undoubtedly the right decision.

The combination of these mechanisms -- persuasive arguments, social comparison and minority influence -- is needed to account fully for how the 8th juror improbably managed to bring the other eleven jurors over to his side. The other jurors first had to recognize the 8th juror's credibility before his persistent willingness to stand alone could persuade them to pay attention to his arguments. He was obviously compassionate, intelligent and fair. Seeing this, the other jurors felt that his arguments had to be given some consideration. We see this when the first juror to change his vote explains his reasoning:

9th juror: This gentleman has been standing alone...Well it's not easy to stand alone against the ridicule of others, even when there's a worthy cause. I respect his motives...The boy...is probably guilty. But I want to hear more.

Now let us consider how this meeting might have proceeded in an electronic meeting room where communication is text-based, lacks nonverbal cues, is often anonymous, and the participants contribute their comments simultaneously. One intention of these design features is to reduce process losses associated with the effects of social cues (DeSanctis, 1993; Wagner, et al., 1993; Dennis & Gallup, 1993;
Jessup, Connolly & Galegher, 1990). Rao and Jarvenpaa (1991) have argued specifically that these features should reduce the reluctance of minority opinion holders to express their opinions. But there are theoretical reasons to challenge their conclusion that increased decision quality will result.

Consider the tools of persuasion that the 8th juror used. Social cues were vital to his success. In an electronic meeting, without nonverbal evidence to the contrary, the other jurors could easily have believed the 8th juror to be a crackpot. In general, if people have no other information, they attribute characteristics of a message to the message bearer (Snyder & Jones, 1974; Jones, Riggs & Quattrone, 1979; Cantor, Pittman & Jones, 1982). But in face-to-face discussion the other jurors could observe from his behavioral style that the 8th juror was reasonable and intelligent. The only weapon left to the 8th juror in an electronic meeting would be persistence, but would his alone have been sufficient to effect attitude change among the other jurors? Research on minority opinion holders would suggest not. Persistence must be combined with a credible behavioral style to bring about opinion change (Nemeth, 1986; Moscovici, 1985). In fact, Moscovici (1985) argues that stubborn persistence may produce change opposite to what which the minority intends, especially if the majority is heavily opposed to the minority’s position. Moreover, if discussion is anonymous, no one’s status as a minority opinion holder would be clear. That is, there would be no way to be certain if “minority” arguments were coming from one or from several individuals.

Thus while electronic meeting rooms may provide the conditions to encourage the expression of minority opinions (Rao & Jarvenpaa, 1991), those opinions may not have the same degree of influence as they have in face-to-face discussion. Recent empirical work supports this conclusion. McLeod, Baron, Weighner and Yoon (1997) found that minority opinion holders were least influential during anonymous EMS-supported discussion, even though they were most vocal under those same conditions. Other evidence regarding influence in EMS communication has been equivocal. Dubrovsksy, Kiesler and Sethna (1991) found that electronic communication equalized influence across group members. Zigurs, et al. (1988) reported weak evidence for equalized influence. Ho and Raman (1991), McLeod and Liker (1992), Watson, et al. (1988) and Weisband, Schneider and Connolly (1995) found that electronic communication did not result in more equal influence.
One clear direction for future research therefore is the effect of electronic communication on influence and persuasion processes. In addition to influence distribution, the effect on influence strategies should receive attention. If these technologies reduce social cues, then we might expect that persuasion strategies should be based primarily on argument content. But, there is growing evidence that the quality of arguments may not be self-evident under electronic communication. For example Dennis (1996a,b) and McLeod (1997a) found that even when groups were able to uncover in electronic discussion the critical information necessary to reach a correct decision, they were not likely to make that decision. The groups apparently were not able to recognize the significance of the information they possessed. Perhaps in face-to-face meetings this is a function served by social cues. In organizationally based groups, team members rely on other members who have relevant expertise to provide meaning for ambiguous information (Weick & Meader, 1993). Not having the ability to do this may offset the positive effects of reduced social cues.

The predominant orientation within the literature on electronic meeting systems has been on reducing the negative effects of social cues, such as domination of discussion by small subgroups (DeSanctis, 1993). A second area for future research therefore is to expand assumptions about the role of social cues in group decision-making. The goals of this research would be two-fold. One goal would be to determine when reducing social cues is most beneficial, and the other would be to identify ways to replace the positive effects of social cues when electronic meetings are used. Such a research effort might begin with the characteristics of a group's task. One hypothesis that has received mixed empirical support is that social cues are necessary for tasks characterized by equivocality, while they are inappropriate for unambiguous tasks (Hollingshead, McGrath & O'Connor, 1993; McGrath & Hollingshead, 1993; Poole, Shannon & DeSanctis, 1992; Trevino, Daft & Lengel, 1990). The role of social cues in helping group members reach a common understanding of their task is another important question (Cannon-Bowers, Salas & Converse, 1993). Mantei (1988), for example, has argued that electronic meeting systems facilitate this understanding better than face-to-face communication. There is virtually no empirical evidence addressing this.
In order to replace positive functions of social cues, future research can focus on determining what identifying information participants in electronic meetings should be given about each other. What is the appropriate amount of data to enable them to figure out which person can best provide guidance on which issues, while not compromising their feeling of anonymity? Barua, Lee and Whinston (1995) have proposed that anonymity also affects the amount of effort individual group members put into task performance. Anonymity may reduce personal accountability, and increase shirking behavior (Valacich, Jessup, Dennis & Nunamaker, 1992). If Twelve Angry Men had occurred in an electronic meeting environment, the 8th juror would have been less able to apply peer pressure to the individual jurors most inclined to avoid discussing the case. Further research on different types and levels of anonymity in electronic meetings should be conducted (McLeod, 1997b; Valacich, et al., 1992) to determine under what circumstances is anonymity most effective.

A third research direction implied by the Twelve Angry Men story is the effect of electronic meeting systems on information exchange. The jury in Twelve Angry Men received an incomplete and strongly biased set of information about the case. We know that the decision suggested by that information would have been incorrect. The important research question is, when would an electronic meeting system have helped this group to discover that they were heading down the wrong road, and when would it have simply speeded their journey? The research of Garold Stasser and his colleagues (e.g., Stasser & Stewart, 1992) has shown that the information that group members hold in common tends to dominate their discussions and final decision, even when that information is biased toward an incorrect decision. Information held by only a small subset of group members is frequently overlooked; the problem lies in when this information is key for task performance. We might predict that the features of electronic meeting systems, especially parallel input, would facilitate more thorough information exchange. The data available on this question does not paint a hopeful picture, however. Dennis (1996a,b), McLeod (1997a) and Marin (1993), in independent studies, all found that although EMS-supported groups were more likely to uncover crucial information than were face-to-face groups, they were no more likely to put it together to reach a correct decision.
This discussion of *Twelve Angry Men* can be used to consider the important role that social cues may play in groups discussions set in organizational contexts. In addition to the research directions suggested here, a practical question involves when organizational members should be willing to give up using social cues as a means of persuasion. A second practical question involves the confidence with which organizational members judge the quality of ideas in the absence of social cues. Given the great complexity and equivocality of most organizational decision-making situations, the utility of disguising people's opinions will have limits. It would be of both theoretical and practical importance to have a greater understanding of those limits. The next section of the paper will include further discussion on the role of social cues and EMS use.

**Emotions And Symbolism In The Last Supper**

Current work on the design and use of EMS is predominated by a rational perspective that the chief purposes of meetings should be to exchange work-related information, to make decisions, or to accomplish tasks (DeSanctis, 1993; Clapper & Prasad, 1993). Therefore, the purpose of technology is to reduce common problems experienced in traditional face-to-face meetings, such as incomplete exchange of information, or domination and inhibition of individual participants (DeSanctis & Gallupe, 1987). Reducing social cues, through parallel access, anonymity and the absence of nonverbal behaviors, has been seen as a major way that EMS can reduce some of the meeting problems thought to stem from non-task communication and behaviors. From this view, therefore, symbolic and expressive behaviors in meetings contribute to process losses (Steiner, 1972).

Reducing such "non-rational" processes in ad hoc laboratory groups -- the most common source of data in the EMS literature (Fjermestad & Hiltz, in press) -- does not have much consequence. But these elements become important in organizationally-based groups where members share historical and social contexts, where they are influenced by formal and informal structures, and where the tasks they perform have meaning and consequences that transcend any single meeting. It is argued here that non-rational processes are a legitimate part of all organizational groups, and are in fact important for task accomplishment (McGrath, 1991; Hackman, 1987; Bales, 1953; Wells, 1991; Smith & Berg, 1991). For example, meetings are also rituals that express organizational values (Beyer & Trice, 1987); they can be
opportunities for individual members to develop interpersonal skills; they can be chances for teams to improve their ability to work together in the future (Hackman, 1987; McGrath, 1991). This argument raises the two questions that will be addressed in this section. First, if we accept that non-rational processes are pervasive in organizational meetings, then is it actually possible for EMS to reduce these processes to any significant degree? Second, if we accept the importance of non-rational processes in organizational meetings, when is it desirable and appropriate to reduce these process through EMS use, if it were possible?

The Biblical event, The Last Supper, was chosen to illustrate these issues because of the prominent role that symbolic and emotional elements played there. It is difficult to think of The Last Supper as a meeting, but this gathering was nonetheless one of many such meetings where Jesus and his 12 Apostles conducted the work of their organization (Haley, 1969; Asimov, 1982; Meier, 1997). The Last Supper models non-rational processes found in most, if not all, long standing organizational groups. The further improbability of imagining The Last Supper in an electronic environment highlights what would happen to non-rational processes in such an environment. It is important to note that the issue of whether or not it would be appropriate to conduct a meeting of great emotional and symbolic significance like The Last Supper with EMS is not being addressed here. Rather, it is argued that emotional and symbolic elements are part of all organizational meetings. Therefore the issues to be addressed, as stated in the previous paragraph, will be focused on the probable and desirable effects of EMS on those elements.

It will be useful to examine first what was important about The Last Supper from an organizational and task accomplishment perspective. The Last Supper was momentous because it was during this occasion that Jesus revealed to the Apostles the core of his mission -- to establish a New Covenant between God and humanity which was to replace the prevailing religious laws of the Old Testament (Strassfeld, 1985; Asimov, 1982). Jesus expressed the essence of this New Covenant in the following passage from the Gospel of John: This is my commandment, that you love one another as I have loved you. Greater love has no man than this, that a man lay down his life for his friends (—John 15:12-13). He further illustrated the message physically through powerful symbols. He shared bread and wine with the Apostles -- substances that symbolized his own body and blood (see Matthew 16:28-29;
Mark 14:4 and Luke 22:20). The Apostles’ consumption of these literal embodiments of God’s New Covenant signaled their acceptance of and their part in promulgating it. Jesus’ act of washing the Apostles’ feet at the start of the supper similarly symbolized the new agreement (If I then, your Lord and Teacher, have washed your feet, you also ought to wash one another’s feet. For I have given you example…, John 13:12-15). The simple action of Jesus humbly stooping before each Apostle’s feet was as powerful as any of his words about the importance of caring for others more than for oneself.

The artistic interpretation of The Last Supper presented in the rock opera Jesus Christ Superstar by Andrew Lloyd Webber and Tim Rice (1970) adds a vivid picture of the emotional turmoil that must have been present. Lloyd Webber and Rice’s work highlights the Apostles’ fear and confusion over the alarming events Jesus said were approaching, the bitter conflict over Judas’ foreseen betrayal, and Jesus’ own sadness over the coming abandonment by the whole group, and his very human fears of what was about to happen to him.

The group’s fears were justified for their mission of spreading this New Covenant was a dangerous one. It challenged not only the old religious law, but also the prevailing civic law under the Roman occupation (Haley, 1969; Meier, 1997). Moreover, the widely held belief among the masses that Jesus was the prophesied second coming of God made this challenge especially threatening to the local authorities, (Haley, 1969; Meier, 1997) who thus sought to quash Jesus’ movement. Hence, during The Last Supper, Jesus had to counsel the Apostles about the immediate dangers of his impending arrest and crucifixion, and to warn them of the persecution they would face in their mission of spreading the New Covenant (…indeed the hour is coming when whoever kills you will think he is offering service to God. – John 16:2). He also needed to help them see that they were prepared with the resources to conquer these dangers (…If you abide in me, and my words abide in you, ask whatever you will, and it shall be done for you. – John, 15:7). Finally, he wanted them to know they each would be rewarded with a throne over one of the restored Twelve Tribes of Israel at the time of judgment (Meier, 1997; see also Luke 22:28-30).

The Last Supper story can be used to illustrate the long tradition of research that has shown the complementary relationship between rational and non-rational processes in task groups (Bales, 1953; Bion, 1961; Slater, 1966; Hackman, 1987; McGrath, 1991). Bales (1953) was the first to articulate this
"equilibrium problem" within task groups. He argued that the actions taken toward accomplishing a group's task lead to tensions in the relationships among the group members. Periodic non-task or socio-emotional behaviors are necessary to release this tension and thus restore equilibrium in the group.

Work in socio-analytic theory (e.g., Bion, 1961; Bradford, Gibb & Benne, 1964; Smith & Simmons, 1983; Wells, 1991) provides further insight into the origins of the tensions that Bales describes. According to this theoretical tradition, beginning in childhood all humans face the conflict between the need to depend on others and the need for autonomy. This conflict, an inherent characteristic of the human condition, is reflected within group situations in members' struggles with authority and inclusion (e.g., Srivastva & Barrett, 1988; Wells, 1991) Each action taken toward accomplishing a group's task has simultaneous implications for the group's power structure and the membership status of individuals. To be effective, the group as a whole must recognize this relationship between the task and socio-emotional elements, and its members must explicitly attend to its quality. That is, a group must reach mutual understanding of each other's task and interpersonal roles, and must periodically assess and monitor those roles.

In the work on EMS, the approach to managing non-rational processes has been to eliminate the effects of social cues in task-oriented groups altogether. Rather than having a group address directly the reasons why some members may feel inhibited from contributing, for example, or that other members may dominate meetings, electronic meeting technology provides a mechanical means to alleviate the symptoms of the underlying issues. Anonymous communication may reduce the risk associated with contributing unpopular ideas, but it will not lead a group to consider the more fundamental issue of why the environment is not safe for members to express such ideas openly. Eliminating information on people's social identity may reduce the undue influence of some members associated with their social status, without helping group members learn how to confront issues of power and status directly. Thus, by removing the effects of social cues, group members may not learn how to manage those effects. A group leader may not learn how and when to be influential without being domineering. A member may not learn how to speak up and to defend ideas that are important but unpopular. The group itself may not learn how to value each member's contributions.
Consider the role of social cues during The Last Supper. It was appropriate and necessary for Jesus, in his role of leader, to exert the most influence over the group, and for the Apostles to know that his messages in fact came from him. Moreover, the visual symbols communicated as much meaning as any of the words spoken. Despite the power of these symbols, Judas lost faith and betrayed Jesus to the local authorities, deluding himself that he was saving the group. From a socio-analytic perspective, we can consider Judas as a repository for the fears and doubts of the group as a whole. Once the Apostles confronted and admitted these fears, however, the deep and lasting effect of Jesus’ combined words and actions during The Last Supper became evident. The very next meeting of the group was on the feast of the Pentecost some weeks after Jesus’ resurrection and Ascension into heaven. The reassembled group was visited by the Holy Spirit (Acts 2:1-3), which recalled to them Jesus’ teachings and strengthened them to accept their responsibility for carrying out the mission. From this moment, the Apostles internalized Jesus’ words from The Last Supper, and began the work of spreading the Christian faith (Acts 2: 34-42).

If the issues that interfere with a group’s ability to communicate openly are not addressed directly, they will continue to affect the group and become fuel for future troubles (Smith & Simmons, 1983). A group that turns to electronic meeting technology as a remedy for negative impacts of power differentials may well find that the technology merely reshapes those differentials. Rather than being rescued, the group may find that it has given itself up to a different authority. As group members look to technology, rather than to themselves, to reduce oppressive effects of power differentials, they may form unrealistic expectations and even fantasies about the technology’s ability to improve their group experience. Disappointment, or worse, is bound to result.

For example, there is some empirical evidence that minority opinion holders in groups are more likely to come forward when communicating anonymously through EMS, but at the same time their opinions are less influential than when expressed in face-to-face communication (McLeod, et al., 1997). Thus, disenfranchised group members may find that while they have more opportunities to input ideas through EMS, over time they may find that those opportunities do not translate into greater influence. Groups who do not address the fundamental sources of interpersonal difficulties will find that their interactions continue to be unsatisfactory with EMS use.
The difference is, however, that the technology and its advocates are available to take the blame. What may be set into motion are the dynamics of a well-known phenomenon in the socio-analytic group literature— a revolt against the group leader, with technology in this role (e.g., Bion, 1961; Slater, 1966; Smith & Simmons, 1988; Srivastva & Barrett, 1988). The manifestations of this revolt will be either outright rejection of the technology or grossly inappropriate usage of it. Zigurs, et al. (1991), and DeSanctis, Dickson, Jackson, and Poole, (1991) reported some evidence of such a dynamic. Their results from field studies of EMS use in organizational groups suggested that groups with problems in their underlying processes had trouble using the technology appropriately, and tended to blame it for their difficulties. Thus, where EMS is used to counteract troublesome group dynamics associated with status differentials, the troubles may resurface in other ways unless the fundamental causes are addressed by the group.

The rational perspective that predominates EMS work also is based on the presumption that groups can judge the quality of ideas best when the ideas have been cleansed of the effects of social cues. This assumes, of course, that the quality of ideas can be judged independently of the ideas’ proponents. As was discussed in the previous section on Twelve Angry Men, the social comparison mechanism of opinion change (Sanders & Baron, 1977; Cotton & Baron, 1980) shows this to be frequently not true. Further, there is growing empirical evidence that EMS may actually interfere with groups’ ability to process information, and to apply it appropriately to problems they are trying to solve (Dennis, 1996a,b; Hollingshead, 1996a; Marin, 1993; McLeod, et al., 1997; Miranda & Saunders, 1997). Thus, increased opportunities to input ideas may not necessarily lead to better understanding or ability to judge the ideas’ merits.

A further difficulty with the notion that reducing social cues will help groups to evaluate ideas on their merit alone, is the question of what happens to ideas following the evaluation. If the Apostles had been able to evaluate Jesus’ teachings solely on their content, would they have more readily made a commitment to carry out His mission? Would stripping the ideas of social identity have reduced the emotionalism present – the doubts that led Judas to betray Jesus, or the fears that led the other Apostles to run away and hide when Jesus was arrested? The commitment to carry forward a group’s decided plan of action cannot happen anonymously, if for no other reason than the logistics of knowing who will do what.
More importantly, it has long been established that a public commitment to a course of action is the best guarantee that the commitment will be fulfilled (Lewin, 1947; Cartwright & Zander, 1953). Thus, social cues do play important roles in group task performance and decision-making. In an organizational context, I believe there is limited utility over the long run to reducing those cues. Eventually, each group has to confront the issue of improving its face-to-face interaction.

Indeed, the effects of power and status differentials in on-going groups may not in fact be erased in electronic meeting environments. For example, Hayne, Pollard and Rice (1997) recently found that in established organizationally-based groups, members could accurately identify the authors of technically anonymous comments. Even in laboratory groups, there is evidence that the technology does not reduce social cues to the degree technically expected. Walther and Burgoon (1992), and Walther (1992; 1993; 1996) have shown that people develop impressions of each other over electronic communication channels. Weisband et al. (1995) and Hollingshead (1996b) have found in laboratory groups a persistence of the effects of status differences on communication patterns among groups communicating anonymously. Work reported by McLeod and Elston (1995) suggests that groups communicating anonymously actively seek ways to create rudimentary identities for themselves and each other, thus reducing the level of anonymity.

Thus far, the discussion here has focused on organizational groups' use of EMS as a way to overcome problems with face-to-face meetings. What about groups who do enjoy effective processes, whose members freely express their views, and have healthy power and leadership dynamics? What is the usefulness of EMS for such groups? These questions raise again the paradox noted earlier -- while EMS are most effective in well-run meetings, well-run meetings do not need EMS (Weick & Meader, 1993). In other words, if a group is able to confront and cope with the fundamental issues that cause difficulties in face-to-face meetings, then what use is EMS to this group? On the other hand, if the group is not able to cope with these difficult issues, might EMS use help to sweep problems under the rug where they will eventually spill out?

In groups that do turn to technology as a solution to process problems, the answer to these questions lies partially in the extent to which the introduction of EMS might provide the opportunity to
begin addressing their fundamental difficulties. For example, the decision to try technology may stimulate
a group to consider why its members would find anonymous discussion to be attractive. Such a group
might benefit from using anonymity as a first step toward confronting inhibitory effects of social status
hierarchies in the group. Analogous to the habitual task routines discussed in the section on The Mad Tea
Party, introducing technology may act as a trigger for groups also to address habitual socio-emotional
routines.

In effective groups without significant process problems the value of EMS may lie in its ability to
help these groups accomplish their work more efficiently, and in new ways altogether. For example, a
team of middle and upper level executives I recently interviewed had just begun to use EMS to support
their work on a special project. They felt that the ability to sit in the same room working simultaneously
on their individual parts, while also being able to stop and consult with each other directly, led them not
only to finish much sooner (several hours rather than several days), but also to add content that would not
have occurred to them otherwise. Kozar and Zigurs (1992) Zigurs and Kozar (1994) have explored the
concept of EMS as an actual meeting participant, with clearly defined roles. They reported that
technology was perceived by organizational users as fulfilling roles traditionally thought to be possible
only by humans, such as Gatekeeper and Motivator. Their work reinforces the importance of participants’
setting clear expectations for each other as well as the technology about respective roles and functions in
meetings. Thus EMS use can enhance the normal processes that an effective group might follow, such as
thorough and open record-keeping, or diligently monitoring a meeting agenda.

A final consideration here is the symbolism evoked by the technology itself. This ranges from
the significance of the very choice to use EMS, to the symbols that emerge from groups’ patterns of usage.
For example, the process of setting up an electronic meeting -- creating an agenda, choosing the decision-
making tools, giving participants access to the files, etc. -- can be thought of as a kind of ritual. Further,
this ritual involves many decisions that have the power to communicate important information about
values, norms and social status. Who actually sets up a meeting? How open is participation – to all
organizational members, or to a particular selection? If participation is anonymous, how do members
know whether or not they are being left out of certain meetings? If EMS is a scarce resource in an
organization, which meetings use this technology? Questions such as these apply equally to traditional face-to-face meetings. Indeed, electronic communication technology use as much reflects an organization's social norms as it potentially alters those norms (e.g., Fulk, et al., 1990; Rice & Shook, 1989; Fulk, 1993; Schmitz & Fulk, 1991). Rather than eliminating symbolic and emotional factors, EMS use can instead reflect and reinforce them.

In summary, the rational approach to group communication and decision making that characterizes current research and practice in EMS use discounts the relevance of emotional and symbolic processes in organizational groups. Attempts to reduce group process losses by reducing the effects of social cues may be both ineffectual and detrimental over the course of everyday organizational use of EMS. Rather, future research should examine the role of technology in groups with healthy group processes, and the technology's potential to assist other groups to improve their basic processes.

Brave New World For EMS Research

As everyday EMS use increases, this technology will become incorporated into the fabric of organizations, where it will both shape and be shaped by groups' patterns of interactions and work. In order for research to continue to be informative, relevant and ground breaking, it needs to move away from focusing on the phenomenology of technology, to understanding technology's place within these patterns. What is required are new metaphors for EMS use that fit organizational contexts. Poole (1990), for example, discussed the importance of metaphor in developing theory and guiding consequent research about group communication. Olson and Olson (1992) call for new metaphors specifically to guide EMS research. In this final section I suggest several new metaphors that can help fashion an agenda for future research in this area.

Refiguring Metaphors-In-Use

One metaphor that comes from the prevailing rational view in the EMS literature is the "meeting-as-marketplace." The basis for this metaphor is the ability of EMS to uncouple the speaking and listening components of communication. Parallel input devices and anonymity provide the means for all participants to "talk" (i.e., type) at once without having to "listen" (i.e., read) to what others are
saying. Although everything spoken in a face-to-face meeting is not necessarily listened to and heard (Hewes, 1986), there generally is correspondence between these two halves of the communication cycle. In contrast, nothing inherent in EMS-mediated discussion creates this correspondence. Indeed, one of this technology's touted benefits is the separation of the two. Meetings therefore are marketplaces where ideas are contributed and are pursued or not, supposedly based purely on merit. Meeting participants are the buyers and sellers. As sellers, participants contribute ideas to the market with the hope that the ideas will be consumed by others. That way, participants who contribute ideas accepted by others can shape group decisions according to their own perspectives. But in EMS-mediated meetings, contributors do not always know how thoroughly, if at all, their ideas will be digested. As buyers, participants peruse the offerings contributed by others, choosing those which they find valuable. Participants can use their buying power to support ideas, also to shape decisions according to their own perspectives. Buyers do not know, however, if the pool of ideas represents the best available. The analysis of 12 Angry Men illustrated the potential problem when a group tries to make a decision based on a biased information sample. This marketplace metaphor raises two questions. The first is, what criteria can be used to judge idea quality, and the second is what is the motivation to contribute ideas to the marketplace if recognition for the ideas is not possible?

The criteria used to evaluate ideas will vary according to the kind of task facing a group as well as the operating procedures and norms. The discussion of 12 Angry Men illustrates how a group's definition of its task can change the criteria used to evaluate idea quality. Moreover, if a group goes about solving the wrong problem, having the ability to evaluate ideas solely on merit will not much matter. The merit itself will be unclear. Even when the problem is clearly and accurately defined, there still remain questions about groups' ability to apply evaluation criteria appropriately. In recent work, Dennis (1996a,b), McLeod et al. (1997), McLeod (1997), Hollingshead (1996a) and Marin (1993) all found that when groups worked on problem solving tasks supported by EMS, they failed to recognize high quality information that was key to solving their problems. These studies found that EMS facilitated the input of information, but that it seemed to inhibit the processing of that information. Taken together this line of work raises a serious challenge to the notion that stripping social cues from task communication better
enables groups to evaluate information. An important avenue for future research therefore would be to examine information processing in EMS supported problem solving.

The issue of motivation is also important. Although anonymity offers protection for expressing unpopular or controversial ideas, it also does not allow credit for good ones. How long will people in organizations continue to be motivated to contribute high quality ideas in anonymous discussion without being rewarded for them? At the same time, what motivates participants to pay sufficient attention to the contributions of others? Traditional face-to-face meetings operate on ideal norms that people will contribute information that is valuable and relevant to group task accomplishment. In turn, they will also give full and respectful attention to others' contributions. Social cues provide the pressure to enforce these norms, although this ideal is not always realized in face-to-face communication (Hewes, 1986). Is it reasonable to expect or even to desire this ideal in electronic communication? Should an electronic means to maintain these norms be sought? Or, perhaps a different set of norms should be established. For example, rather than being concerned about whether every person contributes ideas, groups might want to ensure that every topic has had adequate discussion. Thus, another direction for future research is examining new models of meeting interaction that take into consideration changes in participant motivation.

The second metaphor I suggest is “technology-as-participant”. An immediate question rising from this metaphor is, what role would the technology fulfill? The options range from regular participant, to facilitator, even to leader. As a participant, for example, EMS can be seen as a reliable member whose database allows it to respond to queries and to keep thorough records. Perhaps the technology becomes a trusted confidant to whom other members can tell their wildest ideas or their deepest misgivings, without fearing exposure or censure. Considering technology in such roles, it is reasonable to expect that group members may develop emotional responses to and expectations of EMS. An interesting set of research questions can be raised about the impact of these feelings on members’ interaction with technology. For example, what is the impact on technology’s effectiveness if group members perceive it to be other than neutral emotionally? What would be the implications for system design? Should EMS designers consciously include or avoid features that would be likely to evoke emotional responses from participants?
Another possibility raised by the participant metaphor is EMS participating in the role of facilitator. DeSanctis and Gallupe’s (1987) Level 3 EMS would be consistent with such a role. This class of system would actively regulate the pattern of communication among group members, as well as structure task-related activities. The story of the Mad Tea Party provided an example of a group that might benefit from having its fundamental interaction process replaced by a more rational one. At the same time, the caution from this tale is that even an EMS-regulated interaction pattern can be dysfunctional if a group never reexamines it. A focus for research in the future can be to examine the degree of control over a meeting process that is appropriate to place in the hands – so to speak – of technology. Potential questions could explore issues of power and authority. For example, to what extent does power derive from having control over the sequence of activities in a meeting? If such control rests with technology, does that mean that the technology has an actual place in a group’s power hierarchy, and do humans find other means to exert power?

A closely related set of issues can be raised if we consider technology participating in the role of group leader. Again, questions of power and authority would be relevant. In addition, considering EMS as group leader confronts the definition of leadership in groups and meetings in electronic settings. The current literature on self-managing teams, for example, defines the leadership role closer to facilitator, coordinator and coach, than to an ultimate authority and decision-maker (e.g., Manz & Sims, 1987). Can technology, perhaps in the form of Level 3 EMS (DeSanctis & Gallupe, 1987), provide inspiration, support and advice, as expected of today’s team leaders? The discussion of The Last Supper raised some of the potential dynamics that could surround technology when it is cast in a leadership role. That story also highlighted the question, can and should EMS have a direct part in the emotional life of groups? The appropriateness and ability of technology to fulfill such functions is an area of vast research potential.

Janlert (1987) explores further the implications of the participant metaphor for the non-task aspects of group functioning. He notes that embedded in the participant metaphor are implications of intentionality and morality. The assumption underlying the prevalent technology-as-tool metaphor is that EMS is value and emotionally neutral. But, as researchers from adaptive structuration (e.g., Poole & DeSanctis, 1990; 1992; DeSanctis & Poole, 1994) and social constructionist (Fulk, 1993; Fulk & Boyd,
1991; Fulk et al., 1990; Schmitz & Fulk, 1991) perspectives have shown, technology can take on the values and personae ascribed by a group and its social context.

Thus, in the eyes of the users, technology can take on a personality that is benevolent, malicious or somewhere in between. Some questions for research implied by this idea of EMS personality are, what features of technology itself would lead to perceptions of certain personality traits? Should system designers consciously try to imbue technology with a particular personality? What kinds of personalities would lead to greatest system acceptance and effectiveness of use? These questions are a few examples of unaddressed questions that can be derived from the technology-as-participant metaphor and that are significant for organizational contexts.

The final metaphor I suggest here is “technology-as-magic”. EMS’ effects depend on what users believe. An implication of this metaphor is that technology’s effects in groups to an extent are self-fulfilling prophecies. The EMS research that takes an emergent social constructionist perspective is consistent with this metaphor. For example, the main idea in adaptive structuration theory (DeSanctis & Poole, 1994; Poole & DeSanctis, 1990; 1992) is that through interaction with each other and with technology, groups invent structures which serve to reduce uncertainty and ambiguity; these structures in turn guide interaction patterns, which in turn reinforce the structures.

Viewed through the technology-as-magic metaphor, these structures can be seen as mythology that groups create also to cope with the ambiguity and uncertainty surrounding their interactions with each other, their use of technology and their task. The mythology, particularly the characterization of EMS, varies from group to group based on an infinite number of factors. In some groups the EMS myth may be the reliable record keeper, in another it might be the voice of disenfranchised members, while in another it might be a powerful oracle producing answers from the group’s inputs. Each of these myths will be accompanied by a particular structure around technology (i.e., the rules and patterns that regulate interaction). The nature of this structure will depend very much on what participants believe about the place and function of technology in their meeting. Like Peter Pan’s magic dust, if you don’t believe in your group’s EMS myth, it’s just dust.
The technology-as-magic metaphor is an important one to examine also because it can be dangerous. As suggested in the Last Supper and Mad Tea Party discussions, believing in technology’s magical powers can blind a group to root causes of problems. A group can falsely believe that following a process as presented by EMS will lead to effective meetings and high quality decision-making. Norbert Wiener (1964) illustrates the danger of blind reliance on magic through a series of parables, in which each protagonist makes a wish that is always granted to the letter, but in an unexpected and horrible way. The moral of Wiener’s parables is that magic, like computer-based systems, is literal in doing what is asked, but not necessarily what is intended. Adopting an uncritical and magical belief in EMS leaves the door open for unintended side-effects. For example, a belief reflected widely in EMS literature is that increasing opportunities for all participants to contribute in meetings will result in better decision making (e.g., Rao & Jarvenpaa, 1991). But it now is beginning to appear that EMS-supported groups do not know how to cope with the large volumes of information all this participation generates (e.g., Nagausandaram & Dennis, 1993), that they continue to ignore minority held views (McLeod et al., 1997) and that they do not learn new information (McLeod, 1997; Dennis, 1996a,b).

Research implications from this magic metaphor point to the importance of understanding group members’ beliefs about EMS. What factors — both from the technology itself and a group’s environment — influence those beliefs? What is the relationship between beliefs and effective incorporation of technology? This last metaphor can be even considered as a “meta” metaphor. That is, the beliefs that participants hold about technology can themselves be cast as metaphors. Viewing the system as a tool, in the same light as a flipchart or other meeting aid, will lead to particular usage patterns whereas viewing the system as one of the participants will lead to different interaction patterns. Even the choice of verb — use vs. interact — to describe the relationship between humans and technology reflects important differences.

Afterword

These metaphors urge movement away from viewing EMS as a fixed set of tools with a priori functionality. What EMS is and what it does emerges from usage patterns selected by groups. The same
EMS may be a database in one group, a scribe in another and a cheerleader in a third. The most fruitful
direction for future EMS research therefore is away from technology vs. no-technology comparisons, and
toward the factors contributing to effective and ineffective use in a group’s actual context.

For practitioners, the most important implication of this analysis is that EMS may perhaps be
useful only in meetings which are already well-planned and well-run. Absent these qualities EMS may, at
best, increase a group’s efficiency in minor and routine tasks. A greater concern, however, is that using
this technology may hide fundamental problems, or lead groups to expect miracle cures. Thus, general
meeting process skills should be an integral part of EMS training. Training should help users understand
their own power in shaping technology, and steer them away from expecting technology to shape them.

The future of research in EMS lies in fundamental rethinking about traditional notions of group
interaction. The everyday availability in organizations of this technology will lead to new ways of
working together not before conceived. Thus, the analysis here was intended to rattle moorings of what
are becoming traditions in EMS research traditions, and in so doing, to uncover fresh perspectives for
both research and practice.
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Footnotes

1 I am grateful to Don Wolfe for pointing out this connection.