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IMPACTS OF GSS ON MORAL DISCOURSE: AN ARGUMENTATION ANALYSIS

Impacts des GSS sur le Discours Moral : Une Analyse argumentative

Completed Research Paper

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Abstract

Although ethical decision making is a key concern of organizations, the impacts of IT on ethical discourse is an underexplored topic. The laboratory experiment reported in this paper examines the impacts of the use of group support systems (GSSs) on moral discourse. Drawing upon Toulmin's (1958) model of argumentation and Kohlberg's (1976) framework of stages of moral reasoning, we used the technique of argumentation mapping (Fletcher and Huff 1990) to analyze group discussions of scenarios involving music piracy and hacktivism (computer hacking for a social cause) by GSS-supported and face-to-face groups. The results indicate that use of GSS can have a significant impact on the extent and diversity of the argumentation contributed during group discussion involving ethical dilemmas, including the number of grounds and rebuttals and the number of unique stages of moral reasoning underpinning the argumentation.

Keywords: Ethical decision making, GSS, argumentation, moral reasoning

Résumé

L'expérimentation présentée dans cet article examine les effets de l'utilisation des GSS sur le discours moral. Le modèle d'argumentation de Toulmin (1958), les niveaux de raisonnement moral de Kohlberg (1976) et les cartes d'argumentation de Fletcher et Huff (1990) ont été utilisés pour analyser des discussions de groupe impliquant des dilemmes éthiques. Les résultats obtenus indiquent que l'utilisation d'un GSS peut avoir un impact significatif sur le discours moral.

Introduction

Corporate scandals involving companies such as Enron, WorldCom and Parmalat have led some to question whether "business ethics" is an oxymoron. While the intense media spotlight on these cases has heightened public concern, issues of corporate integrity are not new nor are they limited to only a handful of companies. A review of reports in the business news prior to 1999 found that 40 corporations in the *Fortune 100* had committed behaviors that could

be considered unethical, including fraud (accounting, securities and consumer), discriminatory practices, undisclosed executive pay, antitrust activities, patent infringement and other violations of the law (Clement 2006). Although these problems are not new, there is evidence of a growing climate of ethical concern within the business community (Donaldson 2003). While there is considerable debate about how best to create an ethical culture in a company, the end goal of these efforts is ethical decision making – sensitivity to the moral dimensions of a situation and the application of values and principles leading to ethical action.

The research presented in this paper concerns the use of group support systems (GSSs), for discussion of issues involving ethical dilemmas[1]. Many organizational decisions are made at the group level, by top management teams, boards of directors, committees, and so on. A multitude of factors can come into play when individuals jointly confront complex issues that involve ethical concerns. In light of the emotional, cognitive, political and philosophical challenges that can arise in these situations, researchers have recently begun to explore the question of whether IT can be used to provide "ethical decision support" (Mathieson 2007; Chae et al. 2005; Robbins et al. 2004). While the vision for these tools varies, the common goal is to use IT to aid individuals and groups in ways that improve decision quality in terms of the ethical considerations. Because these tools are in the early stages of design, the question facing organizations today is whether use of the current generation of group decision support tools can have a positive impact on the quality of decisions involving ethical dilemmas. For example, in addition to process structuring, one of the major advantages that GSSs may offer for ethical decision making is the anonymity provided to participants. Participants may be more likely to contribute perspectives that reflect their ethical beliefs without intimidation by higher-status individuals or negative evaluation by peers. Given the high emotions and complexity that can surround these discussions, other benefits could include a reduction in the cognitive costs of communication and information access, and minimizing distractions (Davison and Briggs 2000).

Although there are indications that GSSs have the potential to support ethical decision making in positive ways, it is premature to recommend their use without a fuller understanding of how the use of GSS influences moral discourse. To date, only one study by Cappel and Windsor (2000) has specifically investigated the influence of GSS on ethical decision making. In a lab experiment, IT professionals discussed four short ethical scenarios (2-3 paragraphs) involving information systems, with 15-minutes given to discuss each scenario. Results showed no significant difference between face-to-face and GSS-supported groups in terms of decision outcomes, choice shift (absolute difference between the group decision and individual members' average pre-group decisions) and decision polarity (the directionality of decisions in terms of the response scales (i.e., do the groups in one treatment have a greater tendency than groups in the other treatment to evaluate an action in either an "ethical" or "unethical" direction)). The face-to-face groups, however, were able to reach decisions more quickly and to gain group consensus.

While Cappel and Windsor's (2000) study focused on important process and outcome variables of decision-making, *the purpose of the study reported in this paper is to move to a deeper examination of the influence of GSS on the argumentation articulated in group discussion involving ethical dilemmas*. Argumentation is the act of forming a rationale, drawing conclusions and applying them in discussions and decisions (Toulmin et al. 1984). The reciprocal process of reasoned argumentation is the central aspect of collaborative reasoning and decision-making. Therefore, in the context of ethical decision making it is critical to understand how communication mode may influence the content of the discussion in terms of awareness and consideration of moral issues. To make a first step in this direction, we conducted a mixed method study of MBA student groups tasked with evaluating the ethicality of behaviors described in fictitious scenarios involving music piracy and "hacktivism" (computer hacking for a social cause), using different communication modes (face-to-face (FTF) and GSS)). First, we examined the effect of communication mode on two qualities of the group discussion reflecting the breadth, or fullness, of the moral discourse. One quality is the number of different arguments and counterarguments raised in the discussion. For this part of the analysis, we identified and "mapped" elements of the argumentation expressed in the group discussions using the technique of *argumentation mapping* developed by Fletcher and Huff (1990a; 1990b) based on the model of ethical reasoning by Toulmin (1958). The second quality examined in the study was the discourse diversity in terms of the moral reasoning represented in the argumentation. For this, we content-analyzed elements of the argumentation using the framework developed by Kohlberg (1976; 1984) describing stages/schemas of moral

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[1] For the purposes of this research, the term ethical dilemma refers to situations where a decision involves moral issues and moral judgment (i.e., consideration of the question: *What is the right thing to do?*).

reasoning. Lastly, we examined whether communication mode influences the stage(s) of moral reasoning underpinning the argumentation in the group discussion.

In the following section we present the two theoretical perspectives used for the study, Toulmin's (1958) model of argumentation and Kohlberg's (1976) stages/schemas of moral reasoning, and our research model/hypotheses. Next, the research methodology is described (participants/groups, experimental task, and content analysis/argumentation mapping). Results of the statistical analyses are then presented. The paper concludes with a discussion of the preliminary implications of the findings and suggestions for future research.

Theoretical Perspectives and Hypotheses

At a basic level, group decision-making can be viewed as a social process involving interactive argumentation where individuals: 1) take positions, 2) present reasons for their positions, and 3) may change their positions after considering the contributions of others to the discussion (Chinn and Anderson 1998). To investigate the influences of GSS on argumentation in moral discourse we drew upon two theoretical lenses, *viz.,* Toulmin's model of argumentation (1958) and stages/schemas of moral reasoning by Kohlberg (1976). The two lenses and their associated hypotheses are described below.

Toulmin's Model of Argumentation

Historically, the study of argumentation can be classified into two main streams (Eemeren et al. 1987). The first stream treats arguments as the syllogisms of deductive logic, and arguments are evaluated according to whether they are deductively valid. The second stream, originating in the work of Stephen Toulmin (1950; 1958), is based on informal logic or reasoned discussion, treating arguments as rhetorical acts intended to persuade others (Govier 1985; Perelman and Olbrechts-Tyteca 1969). In Toulmin's perspective, "a sound argument, a well grounded or firmly backed claim, is one which will stand up to criticism, one for which a case can be presented" (1958, p. 8). Toulmin's model of argumentation was used for this study, first, because of its fit with the type of informal logic and practical reasoning typically involved in group discourse and decision-making. Secondly, the approach is appropriate for examining argumentation involving ethical issues. Toulmin's initial work, *An Examination of the Place of Reason in Ethics* (1950), was an analysis of ethical arguments and how humans reason about ethical and moral issues. Finally, Toulmin's model enables the deconstruction of an argument into its constituent parts to permit analysis of the macrostructure of interactive argumentation discourse as well as micro-analysis of specific aspects of the argumentation.

In his model, Toulmin specifies six interrelated components of an argument (Toulmin et al. 1984; Toulmin 1958): 1) *claims*: the assertions or conclusions that are put forward for acceptance, 2) *grounds*: evidence or proof that supports the claim; the factual data that is the foundation for the argument, 3) *warrants*: the justification for moving from the grounds to the claims; 4) *backing*: the authorization for a warrant (e.g., a legal statute), 5) *qualifiers*: phrases expressing the degree of certainty placed on a claim (factors that if true, would lead to a modification of the claim's reliance on the evidence), and 6) *rebuttals*: counterarguments; exceptions to the link between claims, grounds and warrants.

While the argument frame developed by Toulmin (1958) has been applied mainly to the argumentation put forward by a single person, it can also be adapted and applied to interactive argumentation, or group discourse (see, e.g., Chinn and Anderson 1998). The two primary elements in Toulmin's model that represent the core of the argumentation in moral dialog in a group setting are the grounds presented concerning the key claim (the dominant assertion in the discussion) and the rebuttals. Group members express their positions primarily through: 1) statements that directly support the key claim (grounds), 2) challenging the key claim (rebuttals), and 3) challenging rebuttals (rebuttals to rebuttals). Other elements of Toulmin's model (qualifiers, warrants, elaborations, subclaims and reiterations) play a supplemental role, used to expand and provide additional details related to these foundational elements. The number of distinct grounds and rebuttals put forward by members of the group is an indicator of the "richness" of the discussion in terms of the diversity of viewpoints that are expressed for consideration by group participants. Unique ideas contributed to the discussion may influence others to think in new ways (Roy et al. 1996). A number of studies have shown that GSS groups generate a greater amount of unique ideas than do face-to-face teams. While results have been mixed, meta-analyses by Benbasat and Lim (1993) and Dennis et al. (2001) found moderate effects supporting GSS use as fostering the generation of unique ideas. Two explanations offered for this

finding are that GSSs provide the opportunity for simultaneous input (no single individual can dominate the discussion), and that the dampening of social cues/status differences may reduce inhibitions of organization members to share their perspectives (Rains 2005). This leads to our first hypothesis:

H1:   The total **number of grounds supporting the key claim and rebuttals (to either the key claim or to other rebuttals)** contributed during group discussion involving ethical dilemmas will be greater for GSS groups than for face-to-face groups.

Ethical Reasoning Theory – Moral Judgment

The second theoretical lens adopted for the study is the framework for moral reasoning developed by Kohlberg (1976). This approach to ethical reasoning places emphasis on cognition (how the person makes sense of the world); the individual's construction of moral epistemology (self-constructed categories of morality such as "justice," "rights," "duty"); and the development of moral judgment, whereby one set of concepts is more developed, or morally "better" than the set of concepts at a "lower" stage of development (Rest et al. 1999). The aim of the theory is to understand the reasoning process of individuals in making ethical judgments, and the underlying assumption is that the reasoning process used by an individual will be based on that person's conception of morality or ethics. The framework developed by Kohlberg (1984), defining six hierarchically integrated cognitive-moral stages is shown in Table 1. The sequence of moral stages reflects an order of increasing difficulty, or complexity, and the stages reflect different levels of competence in making ethical judgments. Higher stages denote greater ethical reasoning capability than lower stages. At Stages 1 and 2, actions are justified largely on the basis of pure self-interest (maximizing rewards, avoiding punishments or obeying authority figures); at Stages 3 and 4, conformity and meeting social expectations are important ("good" behavior is behavior that pleases or helps others, and respect for authority is important); in Stages 5 and 6 "right" is influenced by universal values or principles, defined by the individual apart from the authority of groups (for example, upholding individual rights and dignity is stressed, regardless of the opinions of others, existing rules, norms or society standards) (Rest et al. 1999).

Table 1. Stages of Moral Reasoning (Kohlberg 1984)
Stage 1: Punishment and Obedience Orientation
Avoidance of punishment; unquestioning deference to authority; obedience for its own sake; doing what you are told - "just follow orders."
Stage 2: Instrumental Relativist Orientation
Following rules only when it serves one's own needs or interests, and letting others do the same; the morality of instrumental egoism and simple exchange; right is what's fair, an equal exchange – "let's make a deal."
Stage 3: The "Good Boy-Nice Girl" Orientation
Orientation to interpersonal approval and expectations; decisions are made on the basis of conformity to norms and standards of the family, group, or nation; pleasing, impressing and living up to the ideals of those within your circle; belief in the Golden Rule.
Stage 4: The Law and Order Orientation
The morality of law and duty to the social order; everyone in society is obligated to and protected by the law; perspective based on a conception of social systems as a consistent set of societal, legal, or religious codes and procedures that apply impartially to all members in a society.
Stage 5: The Social-Contract Legalistic Orientation
Promoting the greater good of the wider community ("the greatest good for the greatest number"), while also honoring socially-contracted responsibilities and rights; to preserve the rights and promote the welfare of all members of the society; rather than rigidly maintaining laws, evaluates laws and social systems in terms of the degree to which they preserve and protect fundamental human rights and values.
Stage 6: The Universal Ethical Principle Orientation
Following self-chosen universal principles of justice; the equality of human rights/respect for the dignity of human beings as individual persons; right is defined by the decision of conscience in accord with these principles.

It is important to note that our use of Kohlberg's stages model does not extend to the assumptions of the theory concerning the "staircase" progression of the development of moral reasoning by an individual. Rather, our application of the model is consistent with the view of Rest et al. (1999), where the six moral perspectives are considered moral schemas (cognitive structures), rather than stages of moral development. In this research, we used the framework to analyze the moral perspectives underpinning the argumentation of the group discussions. The stage(s) of moral reasoning present in the discussions is a critical issue, because: a) prior research has demonstrated that an individual's ethical reasoning can become significantly revised as a result of discussion of ethical dilemmas with a group of peers (Thorne and Hartwick 2001), and b) higher stages of moral reasoning have been shown to be associated with more ethical decisions (e.g., Greenberg 2002; Trevino and Youngblood 1990). More diversity, then, in terms of the moral schemas expressed may increase the likelihood that higher stages of moral reasoning are present in the discussion, and, in turn, may lead to more ethical decisions.

When presented with an ethical dilemma, moral schemas will be triggered or elicited and used to provide an interpretation of the situation (Rest et al., 1999). Each member of a group engaged in moral discourse will apply their personal set of moral schemas (developed from experiences, social discourse, etc.) to evaluate the specific circumstances. A diversity of moral schemas, then, will be used by group members to analyze a particular ethical dilemma. Moreover, individuals with highly developed schemas will make more confident and extreme evaluations (Rest et al. 1999). In terms of the group discussion, an important question is whether individuals are more likely to "speak up" in face-to-face or GSS-supported discussions if they perceive that their schemas and moral reasoning are significantly different from those of other participants. We posit that three capabilities provided by GSS can enhance the likelihood that participants will not be inhibited in offering perspectives that differ from those of other participants: 1) anonymity (e.g., Connolly et al. 1990), 2) equality of participation (e.g., Gallupe et al. 1991), and 3) synchronous interaction/delayed feedback. Labeled "reductive capabilities" by Carte and Chidambaram (2004), these capabilities limit certain aspects of traditional face-to-face communication that can inhibit the expression of diverse perspectives. Thus, we propose the following:

H2: The **number of different stages of moral reasoning represented in the core elements of the argumentation (grounds and rebuttals (to key claims and rebuttals))** contributed during group discussion involving ethical dilemmas will be greater for GSS groups than for face-to-face groups.

The final two hypotheses are based on social desirability bias, namely that in face-to-face discussions individuals will be more likely to express arguments based on higher stages of moral reasoning because they perceive that this will be viewed more positively (i.e., "more" ethical) by group members compared to arguments based on lower stages of moral reasoning. We hypothesize that the anonymity provided by GSS will reduce this bias (vs. face-to-face), increasing the likelihood that participants will be candid in expressing their viewpoints even when they perceive that those views will be considered "less" ethical by others in the group. Thus, we propose:

H3a: The **percentage of grounds and rebuttals at lower stages of moral reasoning (Stages 1, 2 & 3)** will be greater for GSS groups than for face-to-face groups.

H3b: The **percentage of grounds and rebuttals at higher stages of moral reasoning (Stages 4, 5 & 6)** will be greater for face-to-face groups than GSS groups.

Research Methodology

To test the hypotheses we adopted the following approach. First, we conducted an experiment where participants, divided into groups, were tasked with discussing fictitious scenarios involving an ethical dilemma and trying to arrive at a consensual decision concerning the ethicality of the action described in the case. The experimental treatments concerned the mode of communication and were GSS and face-to-face (FTF). Group discussions were recorded by the software for the groups assigned to the GSS treatment and audio-taped for the groups assigned to the FTF treatment. Second, we content analyzed the group discussion transcripts and used the output of the content analysis to operationalize variables involved in the hypothesis testing. Finally, we employed ANOVA to test the four aforementioned hypotheses. Below we discuss the three steps in more detail.

Participants and Groups

The participants in the study were 107 MBA students taking an information systems course in a large public university in the United States (17% were international students). In terms of age, 54% of the participants were

under 25, 30% were 25-29, 12% were 30-34; and 4% were over 35. 78% of the participants were male, and 22% female. Over two-thirds of the students were currently employed (full-time 29%; part-time 38%; self-employed 4%), with 15% in management positions and 10% in supervisory positions. Participants had various levels of work experience (19% over 5 years; 20% 3-5 years; 30% less than 3 years; 31% no work experience) and had worked in a variety of different industries. Students received course assignment credit for their participation in the study. The study used ad hoc groups of five members (and two groups of six), which were formed solely for the experiment. Students were randomly assigned to groups. In total there were 21 groups which were randomly assigned to treatments (11 GSS and 10 FTF).

Experimental Tasks

The experimental tasks involved preparation for the group discussion and participation in the group discussion and decision-making. The task and procedures were pilot-tested with eight graduate students and refined prior to the experiment.

One day prior to the group session, participants were given five cases describing situations involving different types of ethical dilemmas. The cases involved one of the following issues: electronic monitoring/privacy, music piracy, hacking/hacktivism, management decisions regarding H1-B visas for IT workers, and analysis of employee data to identify suspects of illegal drug use. Students were instructed to work independently and complete the following tasks: 1) read each of cases and rate the ethicality of the action described in the case using a 7-point Likert response scale (highly ethical --> highly unethical), and 2) complete an on-line pre-session survey questionnaire which included informed consent, demographic questions and the student's ratings for each of the five cases. On the day of the group session, all participants received a training session on the use of the GSS software. Following the training session, students were randomly assigned to a GSS or a face-to-face (FTF) group.

The experimental setting for the GSS group sessions was a room equipped with networked personal computer terminals with *GroupSystems™* software. Random seating assignments were made to ensure that members from the same group did not sit together and participants would not know who else was in their group. Face-to-face groups met in small conference rooms. Each group session was administered by a facilitator following a standard protocol/script. For the GSS sessions, one other person was also available to assist with any technical questions. Groups were instructed that they would be discussing the Music Piracy and Hacktivism cases (see Appendix A) and that they should try to reach a consensus decision concerning the action described in the case using the 7-choice scale from the pre-session survey. Discussion order of the cases was alternated within each treatment. For each case there were two 15-minute rounds of discussion and vote. Results of the vote were shown to group members at the end of each round.

GSS groups conducted their discussion and vote using *GroupSystems™* modules Topic Commenter and Vote, providing electronic communication that was parallel, anonymous and simultaneous. At the start of the session, the facilitator informed participants of the rules for the group session: use GSS only; no verbal comments/discussion allowed; do not look at others' screens; and to raise a hand if technical assistance was needed. Using Topic Commenter, participants were able to enter input at their individual terminals and also see and respond to the input entered by other group members. The Vote function was used to record and display decision choices. FTF groups conducted their discussions orally. Voting slips were used for voting and vote results recorded/displayed on a flip chart.

Content Analysis - Argument Mapping

The first phase of the content analysis was to create argument maps of the discussions of the two cases. Source data were logs of 11 GSS group discussions captured by the GSS software and transcripts of 7 FTF group discussions (due to poor recording quality, the discussions of 3 FTF groups were not able to be transcribed). In total, 36 discussions were mapped (18 groups/2 cases each).

To code the data and create maps, we adapted the coding protocol for argument mapping developed by Fletcher and Huff (1990a). This protocol formalizes Toulmin's (1958) framework and identifies eight elements of an argument, as shown in Table 2. The coding process involved multiple passes through the data, first identifying the dominant key claim put forward in the discussion and classifying other segments of the text into one of the seven remaining elements of the argument. Searching for specific argument components during separate passes is designed to make

identification more accurate and to improve intercoder reliability (Fletcher and Huff 1990a). Specific activities for each pass through the data are: 1) Read through the whole document and identify the dominant key claim in the discussion; 2) Mark the grounds for the key claim; 3) Identify subclaims, elaborations and reiterations. Mark qualifiers and rebuttals; identify explicit warrants; and 4) Provide implicit warrants, as needed, to help make sense of the flow of logic from grounds to key claim. With experience, coders were able to identify more than one argument component at a time. The next step was to transfer the coded material to an explicit map, following the convention adopted by Fletcher and Huff (1990a) of using flow chart symbols for different types of elements. Example argument maps for each of the cases are shown in Appendix B. Three of the researchers participated in the coding and mapping process. Each of the 36 group discussions was coded and mapped independently by two different researchers. Inter-coder reliability was 92.7%, based on frequency of agreement. After assessing inter-coder reliability, the researchers then reconciled their codes and any initial discrepancies were resolved by consensus.

Table 2. Argumentation Elements (Fletcher and Huff 1990a)	
Element	**Description**
KEY CLAIM	A statement put forth as worthy of belief
GROUNDS	Statements brought up to support the claim
REBUTTALS	Counter-arguments to other elements (claims, grounds, etc.)
QUALIFIERS	Indicate the limitations of the claim or the force with which a statement is made
WARRANTS	General statements which justify the logical connection between claim and grounds
ELABORATIONS	Clarifying statements made about any other elements (claims, grounds, etc.)
SUBCLAIMS	Subordinate claims dependent on the acceptance of the claim
REITERATIONS	A restatement of the claim or other elements of the argument

Argumentation Analysis – Stage of Moral Reasoning

In the second phase of the data analysis, core elements of the argumentation maps were categorized using Kohlberg's (1984) framework of moral reasoning. Each ground and rebuttal (to either a ground or other rebuttal) was independently coded by two of the researchers according to the stage of moral reasoning represented in the statement. Example quotes for each stage of moral reasoning are shown in Table 3 on the following page. Some statements were assigned more than one code. For example, the statement "This is illegal, and they are already prosecuting people" was coded as Stage 1 (Punishment and Obedience Orientation) and Stage 4 (Law and Order Orientation). Frequency of agreement for this step was 84.8%, and all differences were discussed and reconciled by consensus.

The output of the content analysis was employed to operationalize key variables involved in the hypothesis testing. Table 4 on the next page shows the phase of the content analysis that provided raw data for each of the four hypotheses and summarizes how the variables were calculated. All variables were measured at the level of a discussion instance.

Results

The results of the ANOVA analysis are shown in Table 5. GSS-supported groups generated a higher number of grounds and rebuttals than face-to-face groups ($F(1,33) = 6.55$, $p = .015$). Therefore H1 is supported. The number of stages of moral reasoning present in the argumentation of GSS-supported groups was also higher than face-to-face groups ($F(1,33) = 5.44$, $p = .026$), and, thus, H2 is supported. There was no significant difference between the percentage of grounds and rebuttals based on lower stages of moral reasoning (1, 2, 3), and H3a is not supported. Finally, while there was a significant difference in the number of grounds and rebuttals at higher stages of moral reasoning (4, 5, 6), it was not in the direction predicted. GSS groups generated a significantly higher percentage of grounds and rebuttals at higher stages than FTF groups (GSS mean = .47; FTF mean .29); H3b is not supported.

Table 3. Examples - Argumentation (Grounds/Rebuttals) by Stage of Moral Reasoning
Stage 1: Punishment and Obedience Orientation
"He's going to lose his job because some computer school dropout bats her eyes at him." (Hacktivism)
"People are getting sued for downloading." (Music Piracy)
Stage 2: Instrumental Relativist Orientation
"The FBI uses hacking to track criminals and terrorists." (Hacktivism)
"Singers make too much money. What do they do for society?" (Music Piracy)
Stage 3: The "Good Boy-Nice Girl" Orientation
"His actions were noble." (Hacktivism)
"Copying music takes away a fair living for an artist." (Music Piracy)
Stage 4: The Law and Order Orientation
"You can't take the law into your own hands." (Hacktivism)
"The government has ruled it stealing." (Music Piracy)
Stage 5: The Social-Contract Legalistic Orientation
"If the info is legit, people will be better off." (Hacktivism)
"People have a right to profit from their creative ideas." (Music Piracy)
Stage 6: The Universal Ethical Principle Orientation
"I could not live with the fact that I did not try to help and lives were wasted." (Hacktivism)
(No examples from Music Piracy discussions.)

Table 4. Operationalization of Variables and Hypotheses			
	Variable	**Data Source**	**Hypothesis** Communication mode
H1	Total number of grounds and rebuttals	Argumentation maps from content analysis of group discussions. Counted number of groups and rebuttals in each map.	GSS > FTF
H2	Number of unique stages of moral reasoning reflected in grounds and rebuttals	Core elements of the argumentation maps were categorized according to stage using Kohlberg's (1984) framework of moral reasoning.	GSS > FTF
H3a	Percentage of grounds and rebuttals reflecting Stages 1, 2, and 3 of moral reasoning and the total number of grounds and rebuttals	*(see above)*	GSS > FTF
H3b	Percentage of grounds and rebuttals reflecting Stages 4, 5, and 6 of moral reasoning and the total number of grounds and rebuttals	*(see above)*	FTF > GSS

Table 5. Results	
H1: *Supported* (# of grounds & rebuttals; GSS > FTF)	▪ GSS_{mean}=14.41 > FTF_{mean}=10.43 ▪ Significant difference $(F_{1,33}$=6.55, p <.015)
H2: *Supported* (# of stages of moral reasoning; GSS > FTF)	▪ GSS_{mean}=4.32 > FTF_{mean}=3.71 ▪ Significant difference $(F_{1,33}$=5.44, p <.026)
H3a: *Not Supported* (% of grounds and rebuttals at lower stages of moral reasoning; GSS > FTF)	▪ GSS_{mean}=.53; FTF_{mean}= .50 ▪ No significant difference $(F_{1,33}$=.24, p <.629)
H3b: *Not Supported* (% of grounds and rebuttals at higher stages of moral reasoning; FTF > GSS)	▪ GSS_{mean}=.47; FTF_{mean}= .29 ▪ Significant difference $(F_{1,33}$=7.85, p <.009); but opposite to the direction predicted
Note: The Case variable (i.e., Hacktivism vs. Music Piracy) was also included in the analysis and its effect was significant for the hypotheses involving the stages of moral reasoning (i.e., H2, H3a, H3b). This, perhaps, could be explained by the specifics of the situation and the nature of the ethical dilemma presented by each case. In future research, we will investigate this aspect in more detail.	

Discussion and Conclusion

The results from this experiment indicate that the use of GSS can have a significant impact on the extent and diversity of the argumentation contributed during group discussion of topics involving ethical dilemmas. In situations where individuals jointly confront important ethical issues, GSS may enhance moral dialog by facilitating fuller expression of individual viewpoints based on different moral schemas, and more extensive argumentation in terms of the number of grounds and rebuttals contributed compared to face-to-face dialog. While these results do not imply that the use of GSS will lead to decisions that are more ethical, there are direct implications related to aspects of communicative practices that are supportive of moral discourse. First, moral disagreement can arise in situations where there is incomplete understanding among individuals due to factual uncertainty or moral complexity (Goodstein 2000; May 1996). A more comprehensive discussion that includes expression of a wide diversity of viewpoints and a higher number of grounds/rebuttals can serve to fill in missing information and bring greater clarity to moral issues. Secondly, GSS can encourage moral dialog by supporting three critical properties identified by Habermas (1984) and elaborated by Kettner (1993). The first property, power neutrality, can be facilitated through the anonymity provided by GSS. Furthermore, GSS use for moral discourse may also facilitate two other important properties - allowing the free expression of interests, and seeking reasoned agreements (Drake et al. 2000), as indicated by the higher number of grounds and rebuttals generated through GSS use compared to face-to-face communication.

Perhaps the most insightful finding of the study is that GSS facilitates a greater diversity with respect to the stages of moral reasoning. When presented with an ethical dilemma, the moral schemas previously developed by an individual will be elicited, including tacit schemas, as well as deliberate, reflective thoughts (Rest et al. 1999). In group discussion, however, there is always the possibility for others to logically and meaningfully disagree with initial moral judgments based on those schemas. Moral schemas can afford a sense of moral certainty. However, a process that supports the explicit articulation of reasoning based on a diversity of moral schemas creates the possibility of persuasion or conversion by providing the opportunity to reflect upon the views of others and to assess the strength of their arguments as well as our own. While the relationship between diversity of moral reasoning in group discussion and the quality of the decision with regard to ethical considerations is beyond the scope of this study, it is not unreasonable to hypothesize that greater diversity may increase awareness, understanding and sensitivity to the moral dimensions of a situation.

The single prior study of GSS and ethical decision making by Cappel and Windsor (2000) focused on process and outcome variables (e.g., time to reach decisions, ability to reach consensus) and group members' perceptions of teamwork, identification with the group, etc. While these factors are important, clearly the foremost issue is to understand how GSS may influence sensitivity to the moral dimensions of the situation under consideration and lead to ethical action. By examining how GSS may influence the argumentation articulated in group discussion, the

current study addresses this fundamental question more directly than the prior work and provides a deeper, more nuanced understanding of this central issue. While we believe this question should be given highest priority, it is also important to acknowledge that the work reported in this paper is also limited due to its exclusive focus on dialog. Future research on this topic needs to examine and integrate our understandings on all aspects of group ethical decision making, including process, dialog and decision outcomes. Related work such as that of Damasio (2003) on the neurobiological basis for ethics and the role of emotions in decision making can also inform these investigations. Finally, it is important that future work move beyond exploring questions framed as GSS vs. FTF and consider whether a mix of computer mediated dialog and face-to-face dialog may be optimal in some situations.

In addition to the insights noted above, the study also makes a methodological contribution by illustrating how argumentation mapping can be used to develop deeper understandings of the ways that collaborative technologies may influence the content of group discourse. These understandings will be critical to our ability to realize visions of a class of tools to provide "ethical decision support" in the future. Finally, the two scenarios involving ethical dilemmas, which are original to this study, can be used for other studies.

We conclude the paper with some additional suggestions for future research. First, as with any study, our investigation was subject to limitations. The two main ones concern the use of MBA students as the study participants and the reliance on fictitious scenarios as triggers for ethical decision-making. Future studies, for example, could examine GSS logs of group discussions where real business issues involving ethical dilemmas are discussed in organizations. While the current study focused on the impacts of GSS on moral dialog, we agree with the call by Drake and colleagues (2000) for a broad program of research focused on investigating the impact of new information technologies on moral discourse in organizations. In this vein, future empirical studies may examine practices and constraints on moral dialog mediated through IT, look into emerging efforts to use IT to foster moral dialog, and explore how people frame messages to colleagues on moral issues as the medium for communication shifts to newer IT formats. Finally, the scope of future research needs to be extended beyond GSS and include such rapidly spreading online technologies as social networks, blogs, and wikis. The insights and methods of the current study make a contribution towards that overarching goal.

Acknowledgements

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Appendix A - Group Discussion Cases – Ethical Dilemmas

Music Piracy Case

Janet Drolet had just returned to graduate school this year and she was happy to be back in the university environment. After receiving her bachelor's degree in Electrical Engineering she had found a position as a junior engineer in a major engineering firm and had worked there for four years. Although she had enjoyed the technical work, it hadn't been long before she set her sights on a new career goal. Janet felt confident that she had the desire, aptitude and the drive to be successful as a manager in a high tech company and she set her sights on that career goal. She reasoned that a good first step towards that goal would be an MBA degree to jumpstart her career in that direction. As soon as Janet knew what she wanted to do, she had worked hard to pay off her old student loans and save enough to return to school. Money was tight and she hadn't been able to find a GA position yet. But she was excited about the MBA program and her classes…not to mention the new friends she was making, and football games, parties and all the other fun things about being a student that she had missed since leaving the university.

Janet was a diehard music fan. Even when she was saving money to return to the university, she always managed to spend a fair amount of money on music CDs. No matter how stressful her job had been or the personal problems she was dealing with, a shopping trip to her favorite music store to check out the newest releases by her favorite bands and artists and add them to her music collection always seemed to set the world right again. Even though she spent a lot on her music, she always felt it was a bargain…much less costly than a therapist! While some of her friends had copied music from each other or downloaded their music from peer-to-peer music libraries like Napster, Janet had always resisted that temptation. Besides, she had been making a good living and could afford to buy the music she wanted. However, now that Janet was at the university and her budget was so limited, her attitude was beginning to change. Some of her new friends had admired her CD collection and had asked her if they could copy the CDs they didn't have. It was difficult to say no to friends, and she felt obliged to share what she had. Besides, it was fun to introduce some of her favorite artists to her friends, and she reasoned that even the artists really wouldn't mind a little 'marketing' of their work.

Letting her friends copy CDs that she had purchased was one thing, but at first Janet still resisted copying music illegally for her own use. It was frustrating, though, to visit the music store now. For every 10 CDs she wanted to add to her collection, she could only afford to buy one…or maybe two if she ate peanut butter sandwiches for lunch for a few days. After one such trip, she made a decision. As long as she was at the university, she would copy music from her friends and peer-to-peer sites. Even if technically a lot of that copying was 'illegal', she rationalized that under the circumstances it was really okay to do. It didn't do any harm. It wasn't really stealing. And it wasn't like she could afford to pay for the music right now. Once she had graduated and was getting a decent paycheck she would begin buying CDs again.
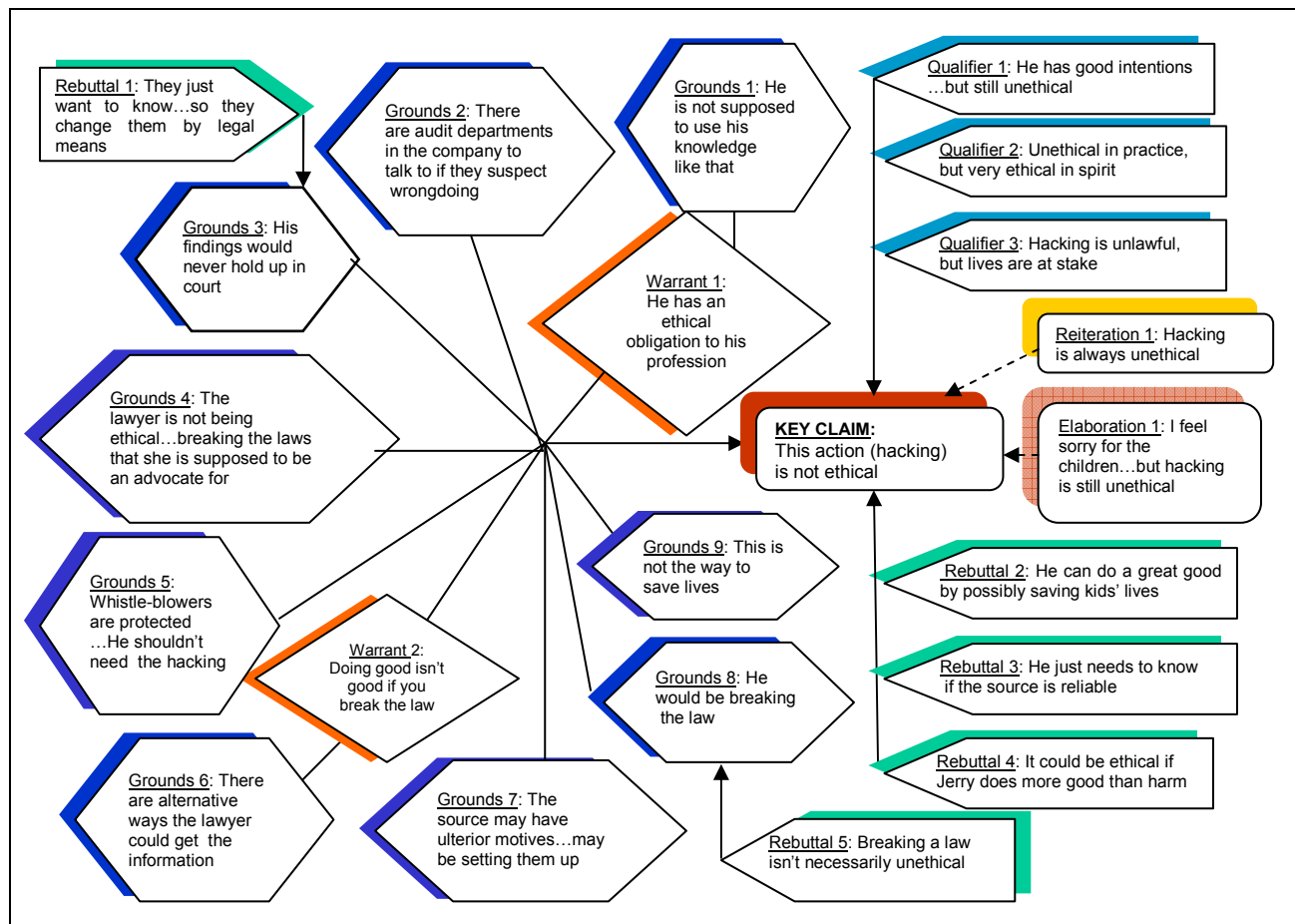
Hacktivism Case

Jerry Shepherd had recently graduated from UC Berkeley with a master's degree in computer science. He had done well in the program and had specialized in computer security. Even though the job market for IT professionals hadn't really rebounded much yet following the dot-com bust, Jerry's expertise in computer security had landed him the best set of job offers of any student in his graduating class. After considering all of his options, he had accepted a position in a new startup company in Silicon Valley, CounterForce Computer Security. The company was small, but had attracted some of the best minds in the business. It was exciting to be in on the ground floor of a new company. The work was challenging – working with real businesses and organizations to identify their security weaknesses and also developing new state-of-the-technology security approaches. Jerry also enjoyed with the 'geek' culture of the company. It wasn't really much different from being at Berkeley except that he was getting a big paycheck every month.

One day Jerry got a call from one of his old friends from Berkeley, Angela Russo, asking him to meet her for lunch to discuss a matter of life and death. When they first met Angela had been a computer science major and had been part of a study group that had eventually become close friends. After completing about half of her coursework for the program, Angela had made a life-changing decision. She had become involved with political activists on the campus and had decided to pursue a law degree. As she had explained Jerry at the time, "There are too many things that need fixing in this world for me to spend my time as a 'bit twiddler.' As a lawyer I can work for positive change in society." Jerry hadn't seen Angela for awhile, but had heard through mutual friends that she had completed her law degree, passed the bar exam and was working for a non-profit organization.

It was good to see Angela again. She was as energetic and intense as ever. The first words out of her mouth were "Jerry, I need your help." Angela told him that the non-profit law firm she worked was a 'watch dog' group monitoring the major pharmaceutical companies. They had recently been contacted by an employee of ABC Drug Company about a drug sold by the company that was used to treat cancer in young children. The employee, a junior executive in the company who asked that his name be kept confidential, had told Angela that the company had faked records concerning the effectiveness of the drug in order to receive FDA approval. He had contacted Angela's firm because he felt the company had to be stopped. Children given this drug rather than other drugs that had been proven to be effective could possibly die. The whistleblower had told Angela that evidence of the faked tests and correspondence among senior executives to hide the evidence was kept on a company computer. He had intended to make copies of that data as proof of the company's wrongdoing, but increased computer security had been put in place recently that prevented him from accessing the files. Angela told Jerry, "That's why I need your help. We just need to know that the files actually exist. At that point our firm can begin working through the legal system to request that the company release the files to us. You are the best hacker I know. All I need you to do is to break into the computer and then let me know if the files are there. I will never tell anyone that you did this for us. All you need to do is this one small thing. Children's lives are at stake."

Jerry told Angela that he would need to think about what she had asked him to do and would phone her tomorrow with his answer. It was a difficult decision. Based on the information Angela had given him about the security protections in place on the computer, he knew it would be child's play for him to gain access. He also knew that he could trust Angela not to reveal to anyone that he had done this for her. On the other hand, here he was a computer security consultant and he knew the laws he would be breaking. After a restless night where his dreams were full of the children who might be hurt if he didn't take action, he called Angela and said he would do as she asked.

Appendix B – Example Argumentation Maps

Rebuttal 1: They just want to know…so they change them by legal means

Grounds 2: There are audit departments in the company to talk to if they suspect wrongdoing

Grounds 1: He is not supposed to use his knowledge like that

Qualifier 1: He has good intentions …but still unethical

Qualifier 2: Unethical in practice, but very ethical in spirit

Grounds 3: His findings would never hold up in court

Qualifier 3: Hacking is unlawful, but lives are at stake

Warrant 1: He has an ethical obligation to his profession

Reiteration 1: Hacking is always unethical

Grounds 4: The lawyer is not being ethical…breaking the laws that she is supposed to be an advocate for

KEY CLAIM: This action (hacking) is not ethical

Elaboration 1: I feel sorry for the children…but hacking is still unethical

Grounds 9: This is not the way to save lives

Grounds 5: Whistle-blowers are protected …He shouldn't need the hacking

Rebuttal 2: He can do a great good by possibly saving kids' lives

Warrant 2: Doing good isn't good if you break the law

Grounds 8: He would be breaking the law

Rebuttal 3: He just needs to know if the source is reliable

Grounds 6: There are alternative ways the lawyer could get the information

Grounds 7: The source may have ulterior motives…may be setting them up

Rebuttal 4: It could be ethical if Jerry does more good than harm

Rebuttal 5: Breaking a law isn't necessarily unethical

Example Argumentation Map – GSS Group – Hacktivism Case

Reading the Map: The Key Claim - "This action (hacking) is not ethical" - was the dominant position taken by the members of this group. This position was also stated as "Hacking is always unethical" (Reiteration) and further clarified through Elaborations (e.g., "I feel sorry for the children…but hacking is still unethical"). Qualifiers expressed limitations of the Key Claim or the force with which the claim was made (e.g., "Unethical in practice, but very ethical in spirit"). Nine reasons, or Grounds, were given to support the Key Claim (e.g., "He would be breaking the law"). Warrants are statements made showing how the Grounds were relevant (e.g., "He is not supposed to use his knowledge like that" [because] "He has an ethical obligation to his profession"). Rebuttals are counterarguments to the Key Claim or Grounds.

Rebuttal 1: Not all artists do this…some of them have families

Grounds 2: Musicians use that money on drugs and rock and roll and stuff

Qualifier 1: It depends on who transferred that music to you

Rebuttal 7: That's like blaming a gun manufacturer for someone's death because they made the gun

Grounds 3: She has purchased cds in the past and will in the future; she just can't afford it now

Grounds 1: I've done it before and I consider myself an ethical person

Reiteration 1: No way, it's not. completely ethical

Reiteration 2: It's not highly ethical but not unethical.

Warrant 1: It's not like she has been freeloading her whole life

Grounds 4: Some sites allow musicians to share music

Rebuttal 5: "Thou shalt not steal"

Rebuttal 6: There are links between a lot of knockoffs and terrorism

KEY CLAIM: Downloading music is only slightly unethical

Rebuttal 8: People are losing money. Their profession is to make music

Grounds 5: Downloading has become part of our society and CDs cost too much

Elaboration 3: What if I took your Tiger card and spent your money?

Warrant 2: It's like a free marketing tool

Elaboration 1: In China copies are better than the original

Elaboration 2: How would you like it if I mass-produced your degree and gave it out to people?

Grounds 6: Borrowing a CD from a friend led me to buy one of their other albums

Elaboration 4: Is it ethical to make a cd for $5 and sell it for $18?

Rebuttal 2: You need to think about it from an American perspective

Rebuttal 4: Downloading music is different

Rebuttal 9: It's not a marketing tool, it's stealing

Rebuttal 3: They charge so much because people rip them off

Example Argumentation Map – Face-to-Face Group – Music Piracy Case