INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

UMI

A Bell & Howell Information Company
300 North Zeeb Road, Ann Arbor MI 48106-1346 USA
313/761-4700 800/521-0600

The Effects of Anonymity on Individuals Using Group Decision Support Systems
by
Julie Ferrari, B. Comm.

A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfillment of
the requirements for the degree of

Master of Management Studies

School of Business

Carleton University
Ottawa, Ontario
August 8, 1997
© copyright
1997, Julie Ferrari

National Library
of Canada

Acquisitions and
Bibliographic Services

395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque nationale
du Canada

Acquisitions et
services bibliographiques

395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file *Votre référence*

Our file *Notre référence*

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-27036-X

Canada

The undersigned recommend to the Faculty of Graduate Studies
and Research acceptance of the thesis

THE EFFECTS OF ANONYMITY ON INDIVIDUALS USING GROUP
DECISION SUPPORT SYSTEMS

submitted by Julie Ferrari, B.COMM. Honours
in partial fulfilment of the requirements for
the degree of Master of Management Studies

Thesis Co-supervisor

Thesis Co-supervisor

Director, School of Business

Carleton University

August, 1997

ABSTRACT

The purpose of this research was to examine the affects of anonymous input methods on individuals participating in electronic brainstorming sessions. In this study the individual was the dependent variable and the changes that occurred in performance in two different experimental settings were investigated. It was suggested that remaining completely anonymous while participating in a group meeting may affect the outcomes of the meeting by removing some of the barriers to communication. In particular, the emotional state of the participants may be altered, which may in turn lead to more productive and efficient group performance.

Findings indicated that there was a correlation between the emotional state of a participant and their performance. In addition, where performance was measured by the variety of responses, there appeared to be a significant difference between participants who participated in the anonymous sessions and those who participated in the identified sessions.

ACKNOWLEDGEMENTS

This thesis would not have been possible without the contributions from my family, friends and colleagues. It is impossible to name all of these individuals, however the following people must be mentioned. My sincerest thanks to everyone on my committee, George Haines, David Cray and especially Deborah Compeau, whose patience, support and friendship were greatly appreciated. I should also thank Jean Blair for all of her assistance, including quick answers to panicked phone calls.

I would like to extend my gratitude to my close friends (Jennifer and Jill) and co-workers at Carleton University (the Admissions Office and especially the Business Office). Without their patience, support, and sometimes participation, this thesis would not have been possible.

My parents and both of my brothers also deserve my gratitude for their love, encouragement and ability to know when not to ask how things were going. Their constant support and belief provided me with the determination necessary to complete this project.

Finally, I would like to thank my husband, Frank, whose support and encouragement helped me make it through the slow times. I know that the completion of this paper is as much a victory for him as it is for me.

CHAPTER 1	1
INTRODUCTION	1
CHAPTER 2	5
LITERATURE REVIEW	5
I. GDSS DEFINED	5
II. THE GOALS OF A GDSS	7
III. THE NEED FOR A GDSS	8
IV. GROUP DECISION MAKING	9
V. FACTORS THAT EFFECT PERFORMANCE IN A GROUP SETTING	11
VI. BRAINSTORMING	13
VII. ELECTRONIC BRAINSTORMING	16
VIII. ANONYMITY	17
IX. SUMMARY	19
X. RESEARCH MODEL AND HYPOTHESES	20
CHAPTER 3	24
METHODOLOGY	24
I. OVERVIEW	24
II. PARTICIPANTS	24
III. FACILITATOR	25

IV. CONFEDERATES	26
V. SOFTWARE	27
VI. MEASURES	28
PERFORMANCE MEASURES	28
(A) TOTAL NUMBER OF RESPONSES	28
(B) THE VARIATION OF RESPONSES	29
FEAR OF NEGATIVE EVALUATION SCALE	30
FLOW EVALUATION	31
DEMOGRAPHIC MEASURES	31
VII. EXPERIMENTAL PROCEDURE	31
VIII. EXPERIMENTAL SET-UP	34
IX. PILOT STUDY	34
<u>CHAPTER 4</u>	<u>36</u>
DATA ANALYSIS	36
I. RESPONDENTS	36
II. MANIPULATION CHECK	37
III. ENSURING THE RELIABILITY OF THE SCALES	38
IV. TESTING THE HYPOTHESES	38
V. TOTAL EXPERIMENT TYPE I ERROR	42
<u>CHAPTER 5</u>	<u>43</u>

I. EXAMINATION OF RESULTS	43
II. COMPARISON TO THE PILOT TEST	46
III. MANAGERIAL IMPLICATIONS	47
IV. FUTURE RESEARCH	49
V. LIMITATIONS	50
<u>BIBLIOGRAPHY</u>	<u>53</u>

<u>APPENDIX A</u>	<u>58</u>
NUMBER OF SUBJECTS	58
<u>APPENDIX B</u>	<u>59</u>
THE ORDER OF CONTRIVED RESPONSES	59
<u>APPENDIX C</u>	<u>61</u>
THE QUESTIONNAIRES	61
<u>APPENDIX D</u>	<u>69</u>
ALL PARTICIPANT RESPONSES - CATEGORIZED	69
<u>APPENDIX E</u>	<u>76</u>
DEBRIEFING LETTER	76

Chapter 1

Introduction

Over the past nine years there has been a wide variety of research examining the benefits and effects of technical support on group processes. These studies have led to few solid conclusions as results have often been conflicting (Watson, DeSanctis and Poole, 1988; Gallupe and DeSanctis, 1988; Dennis and Valacich, 1993). More research is required to determine clearly under what conditions technical support improves group situations. Most group decision support system (GDSS) studies have manipulated the group setting and then examined the group's reaction. Important information is missing in the area of individual reactions to GDSS changes. In fact, to date there are no studies that have examined how *individual group members* alter their behaviour when their group setting is changed (e.g. allowing members to be anonymous versus being identified). This information is of interest because individual behaviour can greatly affect the output of a group, particularly if some members feel inhibited by their peers (evaluation apprehension). By providing an alternate means of group participation (i.e. electronic) where individuals do not necessarily have to be identified, these reticent members may increase their individual participation, thereby directly increasing the participation of the group. By examining what influences or adjusts individual behaviour, a better understanding of group behaviour may occur.

Group decision support systems aim to reduce the cognitive strain endured by group participants (Gallupe & DeSanctis, 1988). Information overload, production blocking and

response biases are examples of the obstacles that group members have to deal with in meetings (Grise & Gallupe, 1994 and Gallupe, Cooper, Grise and Bastianutti, 1994). Many organizations have implemented aids to help participants deal with the differing communication patterns and personalities of group members in order to overcome these obstacles. Systems have been developed for group decision sessions with the intention of alleviating some of the mental strain and friction that participants may encounter when discussing issues. These systems not only help organize the thought process (for both individuals and the group) in the meeting, but they can also change the way in which the group communicates. Techniques such as anonymous interaction and visual presentation of ideas can alter the way in which the group responds to organizational problems (Grise and Gallupe, 1994).

The purpose of most research on GDSS is ultimately to determine whether or not it is a worthwhile investment for organizations (Gallupe and DeSanctis, 1988, McLeod and Liker, 1992). Current research tends to be directed toward the later stages of the decision process, primarily alternative generation and alternative evaluation. In addition, most of these studies have examined specific attributes of GDSSs or how they affect group interactions and/or results (GDSSs and how they relate to task difficulty or group size) (Gallupe & DeSanctis, 1988, Valacich, Dennis & Connolly, 1994). Research with regards to anonymity has also focused on the later stages of decision making, primarily alternative generation. The studies conducted on anonymous input by group members have yielded mixed results (Jessup, Connolly and Galegher, 1990; Connolly, Jessup and Valacich, 1990; Valacich, Dennis and

Nunamaker, 1992). By manipulating the setting, the task and the feedback that group members receive, great differences in group productivity can result (Connolly, Jessup and Valacich, 1990; Valacich, Dennis and Nunamaker, 1992). The common factor in all of these studies was the dependent variable being measured, the group.

This study focused instead on the individual's behaviour as the dependent variable and investigated the changes that occurred in each group member's behaviour when the group situation was altered. Specifically, it examined the significance of anonymous input methods while participating in an electronic brainstorming session. Group participants were undergraduate students randomly assigned to either an anonymous or identified 'group' brainstorming session. Contrived input was manipulated such that all subjects were exposed to identical group situations on all other factors. Both before and after the brainstorming session, questionnaires were administered in order to measure participant emotional state and opinion when using a GDSS with or without anonymous input methods. This study's purpose was to fill a gap in the current literature where information was unavailable on how GDSSs with anonymous input methods affect *individual* group member reaction.

This research monograph is organized as follows: chapter 2 provides a literature overview, in which an examination of the research on group decision support systems and group decision making is conducted. As the literature overview progresses, more specific topics relating directly to this study are investigated, including anonymity and brainstorming

methods. The research model and the four research hypotheses are then defined at the end of the chapter. Chapter 3 follows, where the outline of the methodology that was used during the experiment is discussed, including details relating to subjects, instruments, procedures and experimental design. Chapter 4 looks at data collection and outlines the measurement techniques and statistical tests used, as well as the findings for each of the hypotheses. Finally, chapter 5 concludes this paper with a discussion of the results, limitations, contributions and implications of the research.

Chapter 2

Literature Review

An examination of literature is required to establish what research has been done and how it may affect the current study. The areas of interest include two groups of research; general background information on group decision support systems and specific psychological studies that focus on individual behaviour within groups. This review will examine group decision support systems and, where appropriate, introduce some of the psychological studies that have studied issues related to the effectiveness of a GDSS. Important issues are addressed with regards to group decision making and how it can be adjusted through the use of such techniques as brainstorming and anonymous input methods. At the end of the chapter, the hypotheses are derived to fill the gaps in available information regarding these topics in the current research. Specifically, this research brings the two areas of interest together by examining individual reaction while using a group decision support system in one of two possible environments (identified or anonymous).

I. GDSS Defined

DeSanctis and Gallupe, leading researchers in this field, have proposed that a GDSS combines computer, communications, and decision technologies to support problem finding, formulation and solution in group meetings (DeSanctis and Gallupe, 1987). To better comprehend just how effective a GDSS can be in altering the processes within a group, there

must first be an understanding of what a group is and how a group setting can affect an individual's behaviour.

"A group can be defined as an organized system of two or more individuals who are interrelated so that the system performs some function, has a standard set of role relationships among its members, and has a set of norms that regulate the function of the group and each of its members" (Northcraft and Neale, 1990). This definition outlines the major characteristics of a group, and touches upon the areas in which problems can frequently arise. For instance, conflict can arise when group members cannot agree on what the function of the group is or when the roles or norms of the group do not suit all members of the group.

Other group members are often the most salient and powerful contextual influences on individual behaviour in a group. The group can influence the judgements, beliefs and perceptions of its group members, which in turn can affect the members' actions (Northcraft and Neale, 1990). Structuring of group interactions can have a profound effect on the potential results and decisions that are put forth in a meeting. Specifically, there are two major governing forces that can inhibit the free flow of ideas and opinions: the rules of the group and the roles in the group.

The rules in a group setting define the boundaries of acceptable and expected behaviour. They can often be hard to detect as there frequently are informal, unwritten

regulations to which group members conform. The role that each member takes on in the group meeting can also affect the interactions of the group. Regulating the function of each group member can inhibit a free flow of ideas and input, simply because through such regulation the defined 'role' in the group does not permit freedom of expression. These roles are often pre-determined by the position of the individual in the organization outside the group meeting. Again, this may inhibit group performance, as roles define the set of behaviours appropriate for that particular position (Northcraft and Neale, 1990).

II. The Goals of a GDSS

The purpose of implementing a GDSS is to alter the current communication process by reducing the information load and by facilitating the participation of each group member. These benefits can be realized in meetings that are face-to-face or dispersed in nature (DeSanctis and Gallupe, 1987). The goals of a GDSS are to reduce the 'process loss' associated with disorganized activity, member dominance, social pressure, and inhibition of expression. The need to speed up or simply change the way groups interact in a decision session can make a GDSS valuable to the group decision making process (Watson, DeSanctis and Poole, 1988). Therefore, the GDSS goal is to aid in the identification of the best choice from a group of alternatives, by altering the way the group communicates.

The measurement of the success of a GDSS can take many forms. Success can be measured by the timeliness or group satisfaction with the meeting, cost/ease of implementation

or group member commitment to the final decision (DeSanctis and Gallupe, 1987). Therefore, the success of a given GDSS must be evaluated on specific cases based on the goal of that particular group decision making meeting.

III. The Need for a GDSS

The need for a GDSS has increased in the past decade as organizations have had to make quick and accurate decisions to remain competitive in any industry. In addition, the number of participants in a group meeting has also tended to increase, which means that the given number of issues to deal with also goes up. Sorting through the abundance of information can be both time consuming and cognitively straining for the group members (Gallupe and DeSanctis, 1988). Final decisions from such a meeting can take an extended period of time. The advantage of using a GDSS lies in its ability to overcome the common barriers to communication (participant inhibition and ability to enter ideas as they come) and provide the techniques necessary to structure the issues that are raised in the meetings.

Communication difficulties experienced in traditional decision settings can be costly to an organization in terms of both time and money. Even at the most basic GDSS level, common problems with participant shyness or lack of confidentiality can be removed. The more technologically advanced a GDSS, the bigger the potential impact the GDSS can have on the decision process, as a GDSS that uses the most sophisticated software available can control the timing, content and pattern of the groups communications (DeSanctis and Gallupe, 1987).

The ability of the GDSS to function within a group setting relies heavily on the type of communication that occurs and at which point a group is in the decision making process. Recent research has examined most areas of decision making, ranging from problem-finding (Gallupe and DeSanctis, 1988) to alternative generation and evaluation (McCartt and Rohrbaugh, 1989).

IV. Group Decision Making

It is useful to understand the process involved in decision making, more specifically, decision making when it is done in groups. Decision making involves a series of steps which lead to the final decision. The steps involved in decision making are outlined as: identification of the problem, development of alternatives, evaluation of alternatives and selection of one choice, and finally the implementation of the chosen alternative. Simon (1957) described the four different stages in organizational decision making as: intelligence, design, choice and implementation. Simon's four stages are consistent with more current research that also identifies four steps: definition of a problem, alternative generation, evaluation and choice and implementation (Northcraft and Neale, 1990).

Intelligence involves the process of identifying the problems in the organization and addressing the questions of why, where and what are the effects of the problem, according to Simon. The major concern is to distinguish between the symptoms and the actual problems in the organization. Simply dealing with the symptoms will just prolong the problem and end up

costing the organization. However, pinpointing a problem is not as easy as it sounds and very often the problem is masked by many symptoms, making identification of the problem extremely difficult.

The design stage, on which this study concentrated, requires group members to establish more than one possible solution to the identified problem. These alternatives are generated by group members who put forth any ideas that may be appropriate for the situation. Some organizations advocate open and free discussions, called brainstorming (Northcraft and Neale, 1990), encouraging any and all suggestions. Group members are told not to criticize or comment on any ideas so that no individual group members feel inhibited. Responses can be existing solutions or can be remedies newly developed for this particular problem. At this stage it may be necessary to go back to the intelligence phase and collect more information regarding the nature of the problem so that only feasible alternatives are examined. In addition, it is at this stage that the criteria for evaluating the alternatives are developed.

The choice stage in decision making requires the group to choose among alternatives. This stage can be especially laborious, as each of the alternatives must be evaluated and compared to find the most suitable solution. The more alternatives there are to examine, the more time spent at this stage.

Finally, the implementation stage involves the actual execution of the chosen alternative. This stage often spans years, and during the process of implementation, many changes may be made to the original plan.

V. Factors that Affect Performance in a Group Setting

Kiesler (1978) identified five factors that affect the performance of a participant in a group setting: size, setting, previous relationships with others, knowledge of the topic and the amount of conflict.

The *size* of a group can affect personal participation in a group setting. As the size of the group increases, one of two behaviours occurs. Individuals either fight for time to speak, or become shy and quiet.

Comfort and familiarity with the *setting* can also play a vital role in the way in which group members communicate. The setting can affect the mood and the tone that the group experiences, either perpetuating a relaxed, 'laid back' tone or a more rigid, structured atmosphere.

Previous relationships with others can affect group meetings by inhibiting open communication and making members self-conscious in the situation where all members are familiar with each other. On the other hand, if the relationship between members is one that is friendly and relaxed, the uneasiness of the initial ground breaking politeness is avoided.

Those group members who are more *knowledgeable about the given topic* will be more confident in participating, especially in front of others.

Conflict occurs when individuals within a group have incompatible interests. Pressure to conform to the group's opinions may influence the amount of conflict experienced in a group meeting. With increased pressure from group members, the likelihood of conflict will also increase. So will the feeling of dependence on the group - the need felt by a person for the others' approval before making any comments or suggestions. The more group conflict, the less co-ordination, communication and productivity (Northcraft and Neale, 1990).

In addition, Steiner (1972) observed that a group's performance on a specific task is affected by three criteria: task demands, resources of the group and the process by which the group interacts to accomplish the task. *Task demands* consist of those duties or activities that need to be accomplished in order to complete the task. *Resources of the group* involve the different attributes that each of the members bring to the group. Depending on the task at hand, specific resources will be more valuable than others.

Finally, and most importantly for this research, the *process by which the group interacts* to accomplish the task involves the communication structures within the group. With the formation of a group, the initial contact and the setting of rules will influence the outcome and type of communication that will take place within the group. Communication structures include both the roles that members take and the power distribution within the group. Depending upon the way the group initially communicates, future expressions can be either limited or free flowing.

When the goal of the group is to generate as many alternatives as possible, members must feel they have the freedom to express their views, however radical, and also to disagree with the other members. When these two freedoms are taken away, members may resent the group and therefore, decrease their involvement and decrease their drive to accomplish the group's goal.

VI. Brainstorming

Brainstorming is a technique for enhancing idea generation. Osborn (1957), an early supporter of this type of exchange, formalized this procedure by setting the following guidelines; (1) criticism is banned, and (2) any and all ideas are encouraged to be put forth in the group. In a brainstorming session, it is hoped that a freer exchange will lead to more ideas than the total number of ideas conceived on an individual basis. However, contrary to the belief that brainstorming should work, McGrath (1984) showed that brainstorming is not always a better way to generate ideas.

Some of the problems encountered in verbal brainstorming make it easy to see why electronic brainstorming (a method used by GDSSs) may sometimes be a better way of generating ideas. **Production blocking** is encountered when individuals in the group meeting are inhibited from reporting an idea because they do not have access to the floor. Production blocking can occur simply due to the fact that only one person can speak at a time and others

must wait for their turn. Productivity is lost in verbal brainstorming because as Diehl and Stroebe (1991) report, members can not make good use of waiting time as it causes them to forget their idea or they are not listening to others because they are rehearsing their own ideas.

Evaluation apprehension is based on the assumption that many people are unwilling to state some of their ideas because they are afraid of being critically evaluated (Diehl & Stroebe, 1987). In a brainstorming session, some group members may not participate because they think that other members will react negatively towards them or their ideas.

Social anxiety can contribute to evaluation apprehension and can be defined as self consciousness and emotional distress in anticipated or actual social-evaluative situations (Leitenberg, 1990). Very often individuals participating in group situations feel pressure to perform at a level at which they are not comfortable. These situations are believed to include scrutiny or evaluation by others. Social anxiety also includes a condition referred to as situational shyness, an inhibitory response to social situations (Cheek, Melchior and Carpentieri, 1986). Research has shown that individuals react to situational shyness with three different categories of responses. Somatic responses involve those of a biological nature, including an upset stomach, blushing or butterflies. Behavioural responses are those such as fidgeting, gazing or awkward body language. Finally, of most interest for this research, are an individual's cognitive responses. These include painful self-consciousness, self-deprecation and worry about negative evaluation (Cheek et al., 1986).

As a result of evaluation apprehension, members of a group may outwardly yield to the group consensus, while inwardly retaining their own opinions (Kelman, 1961). *Conformity* is defined as the movement on the part of one member towards the group norm as a function of explicit or implicit social pressure from the other group members (Allen, 1965). Research over the past four decades has strongly supported the finding that individuals rely heavily on the opinions and support of others to define and amend their own opinions (Kiesler & Kiesler, 1969; Turner, 1991). Some studies report that even when there is no specific demand for group consensus, individuals will tend to change their initial positions in order to achieve a more homogeneous distribution of opinion within the group (Wortman and Loftus, 1988). Thus, groups can have the power to manipulate or change an individual's ideas if they tend to differ from the group's. Festinger (1954) has shown that individuals evaluate themselves and their ideas based on social comparison and the feedback received from others. Further, this research also points out that being different from others induces instability and uncertainty in self evaluation. Therefore, there is a strong urge for individuals to conform to the standards of the group so as to avoid the unpleasantness associated with being deviant.

Social anxiety and the urge to conform to others opinions may or may not be factors in social settings, depending on the individual. For those individuals who feel inhibited in the presence of others, a forum where non-confrontational communication can take place should result in less anxiety and more participation (Cheek et al., 1986).

VII. Electronic Brainstorming

Research has identified two major advantages to an electronic forum for brainstorming.

First, production blocking is overcome in electronic situations where all group members have the capability to input simultaneously (Gallupe, Cooper, Grise and Bastianutti, 1994). With electronic brainstorming, each member can input their thoughts as they come, rather than having to wait for an opportunity or opening in a verbal group meeting. This ability means that members will be able to make better use of nonproduction time because they will not have to rehearse their ideas or look for openings in the conversation (Gallupe, et al., 1994).

Second, the ability to remain anonymous during a brainstorming session alleviates the problem of evaluation apprehension and some of the issues that relate to social influences and group pressures. In a study by Jessup, Connolly and Galegher (1990), results indicated that in anonymous conditions, behavioural constraints were reduced and members contributed more freely. The comfort of not having to be identified allowed shy group members to feel more secure about entering their ideas. However, anonymous group members also tended to be more critical and probing of others' ideas, when discussions were undertaken after the brainstorming session. This discovery may be of some use as it indicates that ideas may be critically evaluated based solely on their content and not on their origin.

VIII. Anonymity

The idea of allowing group members to enter their suggestions or ideas in an anonymous fashion is very appealing for some group participants (Nunamaker, Applegate and Konsynski, 1988). Anonymity enables members to express themselves without being accountable for their entries. Therefore, it is the idea that is examined and not its originator. A more open and free-flowing idea generation session should result if group members do not feel threatened or intimidated by others.

In addition, ideas put forth by identified group members may be tagged with preconceived notions depending on the person who makes the suggestion. For example, the ideas proposed by those in more senior positions in the company will be given more consideration than those suggestions made by lower level employees. This can be detrimental to group decision making as valid and feasible ideas may be rejected simply due to the source of the suggestion. Optimal performance of the group is hindered because group members must conform to pre-defined roles.

However, anonymity can also have some negative consequences. **Deindividuation** is a term that refers to behaviour reflecting a “dark side” of human nature and may be encouraged by the presence of other group members. This condition occurs when the personal identities of the group members, and therefore the responsibility they feel for their actions, are submerged in the identity of the group (Northcraft and Neale, 1990). Anonymity is an important part of the

deindividuation process, as members are able to diffuse responsibility for their actions and, therefore, will be able to attribute any deviant actions to the group and not to themselves. This means that more deviant, and perhaps irresponsible, suggestions could occur in a setting that allows individuals to remain unidentified and therefore just “part of the group” (Gallupe, Cooper, Grise and Bastianutti, 1994).

Other group problems may be intensified in an anonymous setting. Many problems can result from the group members' ability to submerge themselves into the group effort and therefore decrease their individual effort. In an anonymous situation, this effect may be heightened, as the opportunity for group members to become one of the group is made more available (Valacich, Dennis and Connolly, 1994).

Social loafing is done with the belief that their particular effort will not be missed, as the other group members will make up the difference. Social loafing was examined in an experiment conducted by Ringlemann in 1913 (Kravitz & Martin, 1986) where, in a rope-pulling procedure it was found that an eight-person group exerted about as much force as the sum of four individuals pulling alone. This factor has also become an issue in group decision making, where sessions involve a number of people, and members are not accountable for what they input. Both Milgram (1974), who dealt with experiments in deviant behaviour in groups and Fleishman in 1980 (Northcraft and Neale, 1990), who dealt with the selfish tendency to

maximize personal gain at the expense of others in groups, concluded that as the size of the group increased, individuals' feelings of responsibility and their contributions decreased.

IX. Summary

The feelings of invulnerability and cohesion within the group lead to collective behaviour, in which the group behaves very much like one individual (Janis, 1982). However, in this shell, the individual group members' actions may not always correspond to the group's. One of the ways that group members can express their differing opinions without fear of negative reaction is through the introduction of technology driven group decision aids. These aids provide an opportunity for members to remove themselves from the group setting and behave in a more individual manner, without being identified as doing so. Anonymity permits individuals to express freely their thoughts and ideas without personal criticism or ridicule (Jessup, Connolly & Galegher, 1990). In addition, the ideas put forth should all be judged equally, as no preconceived notions of the idea will be formed when the originator is unknown.

In this study, subjects will be monitored for changes in input. Social loafing may appear to be a factor in this research, as the total number of responses may be dependent upon whether or not a subject is accountable for his/her input (identified or anonymous). In addition, groupthink may also be a factor in the originality of responses. The specifics of the examination of these conditions follows in the research model and hypotheses.

X. Research Model and Hypotheses

The overview of previous research revealed the difficulties faced when individuals participate as a group. In order to counteract some of the possible shortcomings of group work, steps can be taken by groups to ensure that the final product in a group session includes the best combination of individual effort. The examination of group literature has indicated some key features that must be implemented into the current study in order to conduct the experiment in an effective manner (e.g., Jessup, Connolly & Galegher, 1990; DeSanctis and Gallupe, 1987). Influence from other group members and the desire for group consensus can have an effect on the amount and type of contributions some group members will make and will be examined through the manipulation of anonymity. In addition, the determinants of performance can also play a vital role in the participation of subjects. Therefore, all of the five determinants will be held constant (size, setting, relationship, knowledge and amount of conflict), so as not to interfere with the effect being measured.

Remaining completely anonymous while participating in a group meeting may directly affect the outcomes of the meeting by removing some of the barriers to communication (Jessup, Connolly and Galegher, 1990). In particular, the emotional state of the participants may be altered, which may in turn lead to more productive and efficient group performance. Figure 1 outlines the research model that will be used to guide the study. It is hypothesized that anonymity or identification in a group will affect the emotional state experienced by the participant, which will ultimately affect the participant's performance.

Figure 1. Research Model

Three hypotheses were constructed to test and observe any differences in performance that may occur due to a change in the type of electronic brainstorming session an individual participates in (identified or anonymous).

Group members who are identified in a computerized brainstorming session may experience the same emotional state felt by members who participate in the traditional face-to-face meetings (Jessup, Connolly and Galegher, 1990). These group members are more likely to feel accountable for what they say, and, therefore, feel that they are being personally

evaluated. Inhibitions and the fear of looking unintelligent may discourage valid ideas.

Therefore, the first part of the first hypothesis is:

H1(a): In general, group members in an anonymous electronic brainstorming session will experience a more positive emotional state than those members participating in an identified electronic brainstorming session.

There is also the consideration of those members of a group who tend to fear of negative evaluation and avoid social situations. A system that allows for complete anonymity may provide some relief for these members (Nunamaker, Applegate and Konsynski, 1988).

Accordingly, the second part of the first hypothesis is:

H1(b): The difference in emotional state will be more pronounced for those group members who rank high on Fear of Negative Evaluation.

The emotional state of an individual in a group setting can directly affect the performance of that individual. Performance for this study is defined by two criteria; total number of entries (quantitative measures) and response content (a qualitative measure). In a group brainstorming session (where all ideas are encouraged) when members are identified and responsible for their contributions, deviation from the group norm is more unlikely, as by straying from the standard group responses members risk being critically evaluated (Gallupe, Cooper, Grise and Bastianutti, 1994). In this case, members are more apt to expand on perceived good suggestions or simply rephrase them.

In addition, because of the added pressure some members may feel to be perceived favourably, more thought and consideration may be given to input originated by identified

group members, resulting in a longer time between inputs. Finally, because of the more relaxed and less inhibited environment of an anonymous session, group members will be more likely to input ideas as they form in their minds. This will result in a situation where there is a greater total number of entries in the anonymous sessions, when compared to the identified sessions.

The state of flow (Martocchio and Webster, 1992) represents how users feel when interacting with computers and the playfulness they experience. Specifically, when examining human-computer interactions, cognitive spontaneity was found to represent the most relevant factor with regards to playfulness (Martocchio and Webster, 1992). Those individuals who rank higher in playfulness experience a more positive emotional state and will interact more playfully and display exploratory behaviors resulting in enhanced task performance (Miller, 1973). In addition, high cognitive playfulness tends to result in more inventive and imaginative microcomputer interactions (Martocchio et al., 1992). Therefore, the second hypothesis is:

H2: A positive emotional state will result in increased performance for that respondent in an electronic brainstorming session.

Finally, it is predicted that by intentionally manipulating the environment in which the electronic brainstorming session takes place (either anonymous or identified), participant performance may be altered. Thus, the third hypothesis is as follows:

H3: Individual performance will increase in an anonymous electronic group brainstorming session, compared to individual performance in an identified electronic group brainstorming session.

Chapter 3

Methodology

I. Overview

This study involved an experiment conducted to determine the effects of anonymity on individual feelings and behaviour in a group brainstorming session. Participants were randomly assigned to either of two experimental situations: anonymous or identified. A standard environment was constructed to create a simulated brainstorming session, in which each of the chosen subjects participated, on an individual basis, with the experimenter inputting predetermined responses and acting as the rest of the group. The sessions encouraged participants to freely enter all suggestions that they may have had for the particular problem. In this experiment, the question posed was, "What can be done to improve Carleton's public image". In one of the two experimental situations, the respondents were identified by having their names tagged to each of their entries. In the other situation, the respondents were completely anonymous.

II. Participants

The population was defined in terms of the *element* (university students), the *sampling unit* (Carleton University), the *extent* (all registered students; part-time or full-time) and the *time* (during the period of April 1996 to December 1996). Undergraduate students were recruited on a voluntary basis and a draw for \$100.00 was used as an incentive for participation. Students were approached at the beginning of three different courses, 42.140,

42.230 and 42.340, and asked to participate in a graduate research project. The only information revealed was that the research involved an experiment, had two questionnaires and a brainstorming session, and took up a total of about 40 minutes. No specific requirements or restrictions were imposed upon the participants. A sample size of 48 participants was desired, and obtained, in order to ensure a reasonable power when using a student t-test (Appendix A).

III. Facilitator

In this particular study, very little facilitation occurred, and little specific training was required. The experimenter met all participants at the designated room and provided all instruction necessary to participate in the experiment. Constant monitoring of the participants responses was conducted, so as to realize any difficulties they might have been having with the technology. For instance, if there was an unusually long delay between responses, the experimenter would check in on the participants to ensure the technical part of the session was working. All participants were checked on after the fifteenth response was input by the experimenter (just over half way through the brainstorming session).

In any experiment there are questions regarding ethical practices. In this study, some participants were told that they were anonymous. While they were anonymous to the other members (as there were no others participating in the session), they were not anonymous to the experimenter. This was felt not to be a critical ethical issue for two reasons. First, the question used in the brainstorming session was not of a sensitive nature. For example, participants

would not realize a disturbing trait in themselves by participating in the experiment (e.g. that they are sexist or racist). Second, previous research has used somewhat similar minor forms of deception (Connolly, Jessup and Valacich, 1990), and no damaging side effects were reported.

IV. Confederates

In both the anonymous and identified instances, a 'group of respondents' participated in the brainstorming session. While the group appeared to be made up of four people, including the participant, it was actually comprised of one participant and the experimenter. In the identified sessions only, there was always an introduction of 'group members' to the participant. The 'group members' were usually any three people in the graduate computer lab willing to pose as other participants and their names were subsequently used in the brainstorming session. Before a session took place, the three individuals who agreed to act as confederates would be introduced to the participant. A formal introduction was conducted, where the first names of each person would be announced (some individuals chose to shake hands). The confederates would then leave, but the participant was told that they were going to other rooms to participate in the experiment. When the brainstorming session began, responses provided by the experimenter were consistent in both order and content in all sessions (Appendix B).

V. Software

Professor Alan Dennis from the Department of Management at Terry College of Business at the University of Georgia developed software that runs on the World Wide Web called TCBWorks. At present, there are two versions available, one in which the respondents are anonymous and the latest in which respondents are identified. While this software can be quite complex in that it will also evaluate alternatives, for this research study, the part of the software dealing with electronic brainstorming was all that was required. A brief demonstration of the software before the brainstorming session provided all the training necessary to use the software.

Two issues related to the software arose during the data collection sessions. First, with the original version of the software, in order to have each of the responses tagged with a date and time, it was necessary to log in each participant with a name. Therefore, in the anonymous sessions, all entries were tagged with Julie Farmar, still ensuring complete anonymity for the participant. Secondly, and more importantly, it became apparent that the timing of entries was not accurate, as often there was a lag between the time that a comment was inserted and the time that it appeared on the screen (sometimes a delay of up to 60 seconds). This problem was primarily due to the amount of traffic on the internet at different times of the day. Sessions that were run in the morning were faster in response time than were those run in the afternoon. Therefore, time between input which was intended to be used as a measure of performance

was not an accurate measure of human response in the particular software-hardware combination used in this study, and was not used in data analysis.

VI. Measures

Two measures of performance were used in this experiment: total number of responses and the variation of the responses. There was also a measure used to evaluate the emotional state of the participants during the brainstorming session, flow (Webster and Martocchio, 1993). The Fear of Negative Evaluation Scale (Watson and Friend, 1969) was used as the covariate. In addition, there were questions designed to examine the demographics of the participants who participated in the sessions. Refer to Appendix C for a copy of the pre- and post- questionnaires given to participants. The following is an explanation of the measures.

Performance Measures

(a) Total number of responses

This information was readily available by simply keeping the total number of responses for each participant. The software used (TCBWorks) kept a tally of all responses, so upon completion of the experiment, the contrived responses were subtracted and the remaining responses were attributed to the participant.

(b) The variation of responses

Each of the responses entered by the participants was coded according to its content. The purpose for doing this was to measure the diversity in ideas found in each of the experimental situations. Two individuals coded the responses with regards to similarity in nature (i.e. the general intent of the suggestion). If there was any disagreement between coders, there would be a discussion and an agreement reached. This procedure is similar to the ones used in the research by Valacich, Dennis and Nunamaker (1992) and Jessup, Connolly and Galegher (1990). Refer to Appendix D for a complete listing of all categorized participant responses.

Eight different categories were used:

1. use of the media (public promotions)
2. academic amendments
3. policy changes in recruitment and operations
4. social adjustments directed at students
5. personnel adjustment within the university
6. comments on other's suggestions
7. negative comments not based on anything
8. general comments

The first five categories emerged from the pilot study (discussed below). The last three categories were developed due to the overwhelming inclusion of comments by

participants of their own accord. For the data analysis, a score was assigned to each participant based on the number of categories their responses fit in to. For example, if a participant had two responses in category 1 (media) and 5 responses in category 8 (general comments), their score would be 2 because all of their responses could be classified in 2 categories.

Fear of Negative Evaluation Scale

The Fear of Negative Evaluation (FNE) scale (Watson and Friend, 1969) was used to determine how each of the participants felt in social settings. This scale included 30 true/false questions, where a score above 15 indicated a fear of negative evaluation and a score below 15 indicated no fear of negative evaluation. For data analysis, those participants who scored above 15 were assigned a '1' and the others, with a score below 15, were assigned a '2'. Fear of negative evaluation was defined as apprehension about others' evaluations, distress over their negative evaluations, avoidance of evaluative situations and the expectation that others would evaluate oneself negatively (Watson and Friend, 1969). It is important to note that a low score on the FNE scale meant that participants did not fear others' evaluations, it did not mean that those participants possessed a desire for positive evaluation (it indicated the absence of a trait, not the presence of the opposite trait).

Flow Evaluation

The post-questionnaire included a set of questions about the level of playfulness felt during the brainstorming session. Participants were presented with 17 adjectives and asked to circle the number (1 (strongly disagree) to 7 (strongly agree)) that best matched a description of themselves in the brainstorming session. As previously mentioned, participants who rank high on the playful scale experience a more positive emotional state. The flow evaluation, used by Martocchio and Webster (1992), was found to be a useful measure to assess the cognitive playfulness participants felt when using computers. It involves whether the user felt in control, was cognitively challenged and was able to focus on the task at hand.

Demographic Measures

A number of questions were included at the end of the last questionnaire to assess the differences between the participants in identified and anonymous groups. Questions pertaining to age, gender, status and program were all included. There was also an area here for the participants to report on the software (slow or fast, hard or easy to use).

VII. Experimental Procedure

To examine the effects of anonymity versus identification in a brainstorming session, participant responses were tagged with their first names in the identified brainstorming situations. The five determinants of performance (identified in the literature overview) were

considered. First, the **size** of a group was controlled so that it was the same in all sessions. Results from a study by Gallupe et al. (1992), showed that groups involved in an electronic brainstorming session composed of four or more participants are more productive and satisfied than verbal brainstorming groups. It is for this reason that the group size of four was chosen. All sessions took place in the University **setting**, each involving the same type of room and similar stations. By randomly assigning participants to groups, the incident of previous **relationships** was kept to a minimum. The **topic** selected was one of general interest. It was an opinion question. And finally, the amount of **conflict** remained constant in all sessions, as the nature of the question was not especially delicate or sensitive, nor were the contrived responses.

In the identified sessions, an introduction of the four ‘participants’ to each other took place prior to the session. In the anonymous sessions, no introduction of the participant and confederates took place. The participant was simply told that they would be brainstorming with three other people located at different stations around the university (this procedure was similar to the one used in the research conducted by Valacich, Dennis and Nunamaker, 1992).

The rest of the procedure was identical in both the anonymous and identified sessions, except for the tagging of individual entries. To maximize the internal validity of the research, participants were randomly assigned to either the anonymous or identified situation.

The participants were then given the first questionnaire to fill out. This took approximately 10 minutes. The brainstorming topic was then presented (Carleton's public image). A personal interest was created by discussing the ramifications of Carleton's public image and suggesting that a positive image would help those who get a degree from the institution (i.e. the participant). Finally, it was explained to the participant that the purpose of the study was to determine the potential of a GDSS as a vehicle for group meetings over a distance.

Participants were then reminded that in a brainstorming session all suggestions should be entered and they should try to generate as many solutions as possible (they were also told not to worry about spelling and grammar). The participants were asked to spend the next 20 minutes generating plausible solutions.

Following the brainstorming session, another questionnaire measuring the participant's feelings towards the session (flow) was administered. In addition, the last two pages of the post-questionnaire had demographic questions and provided an opportunity for the participant to express what they liked and disliked about the session. It also provided some qualitative information about the software, how they felt during the session and how the software performed during their session (fast or slow). The debriefing of the participants occurred through the mail, where a brief explanation of the experiment was sent to each member. Refer to Appendix E for a copy of the debriefing letter.

VIII. Experimental Set-up

The physical set up of the experiment involved two rooms. One room was needed for the participant of the experiment, where he/she sat alone with a terminal as the only means of communication with other 'group members'. An office in Dunton Tower was ideal for this experiment, as it was quiet and contained the necessary hardware/software for the brainstorming session. This allowed for a situation similar to a distributed group session, where no physical or visual contact was made with other group members. The second room used was 808 in Dunton Tower, the graduate computer lab. This room had the number of computer terminals necessary (3 in the identified sessions, 1 in the anonymous sessions) to conduct the brainstorming sessions.

IX. Pilot Study

A pilot study was conducted prior to the actual experiments to obtain the contrived responses (the "other" group members' responses). This pilot study not only helped generate the needed responses, but it also provided an opportunity to test the software for the experiment. The actual pilot study involved one 30 minute brainstorming session, with four people. They communicated with each other strictly through the computer. Upon completion of the session, the responses were examined.

As a result of the pilot study, 22 of the 35 responses were compiled and used in the research. Only 22 responses were used because of the time frame in which the experiment was

conducted. For example, four people came up with 35 responses in 30 minutes, approximately 9 responses each. To simulate three people, normally 27 responses would be necessary, but the pilot session was thirty minutes and the research sessions were only 20 minutes, so a reduced number of contrived responses was used. When inputting during the experimental sessions, responses were input at a faster rate in the first half of the brainstorming session, simulating the real session where members had a lot of ideas at first, but slowly began to run out. No time lag issues were apparent in the pilot test.

Chapter 4

Data Analysis

I. Respondents

Demographic information was collected from the participants to ensure that both groups were similar in terms of the qualities of the respondents (a random assignment check). This information would also be useful to assess generalizability. Table 1 shows the comparison of this data between groups.

Table 1. Demographic Data

	Ident. Subjects	Anon. Subjects	Entire Pop.	Test	df	p value
Mean Age	24.8	23.5	24.2	t-value 1.15	46	.26
Gender						
Percentage male	41.7	54.2	47.9	chi-sq .33	1	.56
Percentage female	58.3	45.8	52.1			
Status						
Percentage full-time students	91.7	87.5	89.6	chi-sq <.00001	1	>.9999
Percentage part-time students	8.3	12.5	10.4			
Program						
Percentage in arts/soc.science	33.3	50	41.7			
Percentage in business	33.3	33.3	33.3	chi-sq 2.36	3	.50
Percentage in eng/comp.sci.	20.9	12.5	16.7			
Percentage in graduate studies	12.5	4.2	8.3			

The information in Table 1 indicates that there is little difference between the two groups. All tests performed indicated that there were no significant differences between the groups on demographic variables.

II. Manipulation Check

Table 2. Manipulation Check

	Mean (St. Dev.)	t value	p value
Identified Participants	4.71 (0.55)	9.41	<.0001
Anonymous Participants	2.13 (1.23)		

As part of the post-questionnaire, participants were asked to respond on a 5 point scale, where 1 equaled strongly disagree and 5 equaled strong agree, to a question that related directly to whether or not they realized they were anonymous. This question was included in order to ensure that the effects of anonymity were felt and that participants reacted accordingly. Question 11 read: Other group members could identify which entries were made by me. A t-test was conducted in order to detect a significant difference in each of the groups (identified and anonymous). The results indicated that group members did realize they were either identified or anonymous (refer to Table 2).

III. Ensuring the Reliability of the Scales

Before performing hypothesis tests, an evaluation of the two additive scales used in the experiment was conducted. A reliability test (Cronbach's alpha) was conducted in order to ensure that the scales used were internally consistent. The alpha for the flow scale was 0.84 and for the Fear of Negative Evaluation (FNE) scale was 0.70. Thus, both scales exhibited adequate reliability.

IV. Testing the Hypotheses

The first hypothesis (H1a) was that group members in the anonymous sessions would experience a more positive emotional state than those group members participating in the identified sessions. In order to test this hypothesis, a t-test of the difference in means between the experimental groups (identified = 1 or anonymous = 2) for the flow measure was conducted.

Table 3. Flow Scores for Anonymous and Identified Participants

Variable	# of cases	mean	SD	t value	p value
Identified	24	4.96	.77	1.01	.32
Anonymous	24	4.74	.73		

The observed difference in means was .22 with an observed two-tailed significance level of .32. Therefore we cannot reject the null hypothesis and we conclude that there is no

difference in participant emotional state for the different experimental situations. Both groups appeared slightly positive, as a value of 4 indicates a neutral response.

The second part of the first hypothesis examined how a participant's fear of negative evaluation affected their emotional state in the different types of sessions. Given the lack of significance found in H1(a), the term 'more pronounced' is not appropriate in H1(b). Therefore, the interpretation of this hypothesis was slightly changed to test the relationship between the type of group and the emotional state as it is moderated by the participant's fear of negative evaluation. As shown in Table 4, one third of participants rated as having a fear of negative evaluation.

Table 4. Fear of Negative Evaluation Frequency Data

	Value	Frequency	Percent	Valid Percent	Cum. Percent
feared negative evaluation	1	16	33.3	33.3	33.3
did not fear negative evaluation	2	32	66.7	66.7	100.0
Total		48	100.0	100.0	

Table 4 displays the information gathered with regards to FNE. From the data, it appears that one third of participants feared negative evaluation, while two thirds did not. A two way analysis of variance was conducted using emotional state (from the flow information) by the type of group (anonymous or identified) and FNE (Fear of Negative Evaluation). Findings resulted in a non-significant interaction p value of .85. Therefore it is concluded that

emotional state did not significantly change when participants were identified or anonymous, regardless of the intensity of their fear of negative evaluation.

The second hypothesis examined the relationship between the emotional state of the participants and their performance. The data used to test this hypothesis included the flow information and the performance data. The performance of the respondents was evaluated by both the number of responses and the variety of responses (number of different categories the participant's responses fit into), therefore each aspect of performance compared to the emotional state of the respondents is examined separately. Pearson correlation coefficients were calculated to assess the relationship of each type of performance to emotional state (flow).

Table 5. Correlation Coefficients for relationship between Emotional State and Performance

Performance data	Pearson's R - Flow	
number of responses	$r = .41$	$p = .004$
number of categories	$r = .30$	$p = .038$

As shown in Table 5, there is a correlation between the emotional state and the performance of a participant. Both the number and variation of responses provided by the participant tended to increase as the emotional state increased (became more positive). Thus, a positive emotional state seems to result in increased performance for a respondent in an electronic brainstorming session.

The final hypothesis stated that performance would increase in anonymous sessions when compared to performance in identified sessions. To test this hypothesis, the performance data were used, in conjunction with the type of session the participants participated in. As stated before, because performance was evaluated by two different criteria, each was compared to the type of brainstorming session separately.

Table 6. Performance Scores for Anonymous and Identified Participants

Variable	# of cases	mean	SD	t-value	2-tail sig
<i>= of responses</i>					
identified	24	8.67	3.76	.29	.78
anonymous	24	8.38	3.24		
<i>= of categories</i>					
identified	24	3.71	1.16	-2.09	<u>.04</u>
anonymous	24	4.46	1.32		

From the table above, in the number of responses section, the value in the two tail significance column indicates that we cannot reject the null hypothesis. Therefore, it is concluded that there is no difference in the number of responses for both experimental situations. However, the data collected on the number of categories compared to the type of session, indicates that there is a significant difference here. Therefore, it is concluded that those participants participating in an anonymous session possess a certain willingness to venture outside the same responses and vary their answers, compared to those participants participating in identified sessions.

In summary, for all hypotheses tested, the null hypothesis was unable to be rejected in three cases. For hypothesis 2, there was a significant relationship between emotional state and the performance of a participant. It appeared that as participant's emotional state became more positive, the number of responses increased, as did the variation of content in responses. For hypothesis 3, where performance was measured by the content of responses, there appeared to be a significant difference between participants who participated in the anonymous sessions and those who participated in the identified sessions. The participants who were able to remain anonymous while participating in an electronic brainstorming session did vary their responses and perhaps felt more freedom when coming up with responses. Therefore, there does seem to be a relationship between the type of session that a participant participates in (anonymous or identified) and the content of their responses (more variability).

V. Total Experiment Type I error

Because the decision to accept or reject the null hypothesis is based on sample evidence obtained through the data collection, there is always the possibility of rejecting the null hypothesis when it is true (Harnet, 1982). For this study, based on the number of tests conducted (4), the resulting Type 1 error value (experiment wise) is 0.19. As this is the first experiment of its kind (where the individual was the dependent variable) more leniency was used in drawing conclusions in hopes of promoting further research in this area.

Chapter 5

I. Examination of Results

By examining the research model defined in chapter 2, in conjunction with the data analysis, the implications of the study can be observed.

Figure 2. Research Model

H1(a) investigated the relationship between the type of brainstorming session a participant took part in and the emotional state of that respondent. The results of the tests suggest that the type of session has no direct effect on a participant's emotional state. For instance, an individual who participates in an anonymous session will not necessarily experience a more positive emotional state, as originally expected. The second part of hypothesis 1 was

developed to examine the effect of participant's fear of negative evaluation on their emotional state in anonymous and identified sessions. From the resulting data, again in both types of sessions no significant differences were detected in emotional state when fear of negative evaluation was introduced as a moderator. Therefore, even when participants indicated that they were uncomfortable participating with others, their emotional states did not seem to become more positive when they had the opportunity to participate anonymously. This perhaps suggests that a reticent individual's behaviour is not altered by simply changing the method in which they communicate, and that shyness could be an inherent trait. It should be noted that for this particular hypothesis, where four groups are considered, the power of the test was lower at approximately 50% (refer to Appendix A). This could mean that a difference in emotional state may have occurred but was not detected. By increasing the number of participants in the study, the power of the test would increase and perhaps a difference in emotional state would be detected.

The results of this study may have been influenced by other factors that affect the emotional state of respondents. Keyboard entry may have caused some frustration, curiosity may have resulted from the room they participated in (professor's office), or the fact that they knew it was an experiment may have led to an adjustment in the participant's emotional state (boredom). In addition, a general lack of interest in the experimental question or a lack of concern about anonymity (as they did not know the other participants), may have led to a neutral response to emotional state. Finally, while respondents did indicate that they felt

anonymous, there is always the question as to whether or not the question was answered truthfully and in fact respondents truly believed they were anonymous. Having contact with the experimenter and working in a professor's office may have contributed to participant's doubt. Some participants did question their anonymity, not within the group, but from the standpoint of the experimenter. Due to the fact all participants had to be met by the experimenter and the session took place in a professor's office, they sometimes expressed concern about where their input was going upon completion of the session. This was handled by explaining that all responses were stripped of all identifying features (date, time, and in the identified sessions, names) and used for content only. This issue was always brought up after the sessions had occurred, so it may have inadvertently affected their participation.

H2 investigated the relationship between emotional state and performance of the participants. A direct relationship was found to exist when performance was evaluated by the content of responses, and the overall number of responses. This suggests that as the emotional state becomes more positive, the participants tend to increase their performance. It seems logical that as participants feel more playful in a session, that their performance would increase. Several other factors may also contribute to the performance of a participant. Time of day, time of year, interest in topic and past experience with experiments may all affect the contributions of a participant, and could be examined in future studies.

Finally, with hypothesis 3, a relationship between the type of session and performance was examined. When performance was evaluated by the number of responses given by a participant, there tended to be no difference between sessions. This may be due to the fact that regardless of the type of session, participants were equally indiscreetly submitting suggestions or they were equally responding with well thought out suggestions. However, when the number of different categories was used to evaluate performance, there appeared to be a significant difference between sessions. This may indicate that respondents who are able to remain anonymous, and therefore less accountable for what they say, are willing to vary their responses.

In hypothesis 1(a) there appeared to be no effect on emotional state when individuals were anonymous, so it is possible that something other than emotional state may alter to affect that aspect of performance. Alternately, the measure of emotional state (flow), may not have measured the factor that is altered emotionally in subjects when they are able to participate anonymously. For instance, flow does not measure the feeling of deindividuation.

II. Comparison to the Pilot test

In the pilot test, four people participated for 30 minutes, resulting in a total of 35 responses. This breaks down to approximately 9 responses each. In the experiments, subjects also contributed between 8 and 9 responses a session. Therefore, subjects in the experiments appeared to behave similarly to those in the pilot test, indicating a realistic experimental

situation was constructed (individuals in the experimental set-up reacted similarly to those in an actual group brainstorming session).

Periodically a respondent would input a response that was almost identical to a contrived response that had yet to be displayed (something not confronted in the pilot test). In those situations, the input of contrived responses would *not* be altered (so as to maintain consistency in all sessions). Upon completion of one such session, a participant expressed some distress and annoyance at the “other guy who keeps copying my answers”.

III. Managerial Implications

For the purposes of group meetings, a GDSS that has anonymous input methods does not appear to provide a more positive emotional state for group members (does not relax or cause a positive emotional state). This is an important implication because there is evidence that a more positive emotional state will increase performance. A manager cannot rely on the type of session alone to increase the emotional state of the participants (i.e. being anonymous will not make the participants more playful). There is also evidence that the type of session can directly affect the performance regardless of the emotional state, when performance is measured by the variation of responses. In summary, the way in which performance is affected by anonymous input methods may have nothing to do with altering emotional state. Anonymous input methods only seem to increase performance with regards to the variation of

responses, while emotional state seems to increase performance when measured by both the variation and the total number of responses.

In terms of using these findings for management, the purpose of the session must first be determined. For managers, if the purpose of a brainstorming session is to generate diverse responses to a problem, then the ability for participants to input anonymously should enhance performance, as should a positive change in emotional state. Alternately, if the only purpose of the meeting is to obtain as many responses as possible, then this experiment indicates that creating an environment (identified or anonymous) where emotional state is positive would be ideal.

Some of what was found in this study is inconsistent with previous research examining group decision support systems. While this research examined *individual* performance, other studies examining *group* performance found different results. A study conducted by Jessup, Connolly and Galegher (1990), found that anonymous subjects generated more comments (total number of comments). In addition, Valacich, Dennis and Nunamaker (1992), found that anonymity had no effect on ideational performance (variation of responses).

For those individuals interested in the design and creation of an effective GDSS, this research supports the inclusion of two features. First, the GDSS should include the ability to input anonymously. This function was demonstrated to be a valuable attribute, as the

variability of responses was shown to increase with this feature. The second feature to be included is a little more challenging to design. From this research, it appears that a positive emotional state increases participant performance. Hence an effective GDSS design might incorporate the factors that promote a positive emotional state for subjects (further research needs to be conducted to determine what those factors are).

IV. Future Research

There are a number of areas that need to be further explored to get a firm grasp on how anonymous input methods influence individual performance. The issue of the type of questions posed is one that may reflect just how valuable anonymity could be. Varying the nature of the questions (include sensitive or delicate issues) and examining how input is affected would be a good way to determine if anonymous input methods are valuable only under certain circumstances (depending on the nature of the task). This study focused on a question that was not sensitive, yet some research (Gallupe, Cooper and Pollard, 1998) has shown different results as questions become more sensitive.

Examining what other factors influence emotional state may also add to the research already collected. As indicated in this study, a positive emotional state seemed to increase the performance of subjects. It may be valuable to determine what factors affect the emotional state of group participants and how they can be altered in order to retrieve the desired results.

Finally, future studies may also want to examine other measures of performance. In this research, two measures were examined (number of responses and variability of responses).

Perhaps anonymity would influence performance in a more dramatic way when it is evaluated by different criteria. Some of the other measures of performance could include the rarity of a response (where performance would be evaluated on the originality or infrequency of a response) or the feasibility of a response (where performance would be evaluated on whether or not a response was realistic).

V. Limitations

As with all research, there are a number of limitations. One occurs due to the inclusion of students as participants. As these students had no stake in the outcome of the experiment, their commitment to the sessions is questionable. Interest in the topic and general interest in the experiment may have affected some member's participation. However, a problem of some relevance to the participants was chosen in hopes of counteracting some of this effect. In addition, student subjects do not accurately represent the power distribution found in a professional working environment. Inhibitions and opinions may not have been truly replicated, as the supervisor/subordinate relationship did not exist in these experiments.

An issue of timing may have also affected the performance of participants. Unfortunately, it was impossible to conduct all of the experiments at the same time or even at similar times on different days (subjects may have finished a full day of classes, or have just

begun the day) and attention or fatigue may have affected participation. Experiments were scheduled whenever a student was able to participate, and due to the difficulties in enticing participants, there was a wide variation in the time of the sessions, including evenings and weekends. In addition, the experiments were conducted over an eight month period, so varying levels of external pressures may have also influenced performance by affecting concentration levels (exams, assignments, holidays, etc.). Some relevant external factors, such as the Maclean's University Ranking Issue and Carleton's advertising campaign, occurred after all the data were collected and therefore did not affect the study.

Finally, as noted earlier, there is always the question as to whether or not participants truly believed they were absolutely anonymous. Due to the nature of the session, they were aware that they were participating in an experiment, and the setting of the session, in a professor's office, there may have been doubts about anonymity. With technology, some individuals may believe that all input is traceable (this has received some media attention in the last twelve months), making participants feel that perhaps they did not have absolute freedom. This issue was addressed by asking subjects if they thought that other members could identify which entries were made by them, and those in anonymous session said no (manipulation check). However, they were not asked if they thought that the experimenter could identify which entries were made by them, and thus this aspect of anonymity could not be assessed.

Despite these limitations, the current study contributes to the research on GDSS because it questions the usefulness of anonymous input means in group meetings. In addition, it examines the *individual* reaction to the group setting, isolating their feelings and responses. As group work is a product of individual effort, it is useful to determine what factors contribute to enhancing individual performance in an effort to enhance overall group performance. By manipulating the type of session and measuring the emotional state and performance of individuals, a variance in behaviour was seen.

Bibliography

- Allen, V.L. (1965). Situational Factors in Conformity, *Advances in Experimental Social Psychology*, 2, 133-175.
- Allport, F. (1924). *Social Psychology*. Houghton Mifflin, New York.
- Brown, R. (1988). *Group Processes: Dynamics within and between Groups*. Basil Blackwood, New York.
- Cheek, J., Melchior, L. and Carpentieri, A. (1986). Shyness and Self-concept. In L.M. Hartman & K. R. Blankstein (Eds.), *Perception of self in emotional disorder and psychotherapy* (113-131). Plenum, New York.
- Clawson, V. K., Bostrom, R. P. and Anson, R. (1993). The Role of the Facilitator in Computer-Supported Meetings. *Small Group Research*, 24, 547-565.
- Connolly, T., Jessup, L.M., Valacich, J.S. (1990). Effects of Anonymity and Evaluative Tone On Idea Generation in Computer-Mediated Groups. *Management Science*, 36, 689-703.
- Cook, T.D. and Campbell, D.T. (1979). *Quasi-Experimentation: Design & Analysis Issues for Field Settings*. Houghton Mifflin Company, Boston.
- Dennis, A.R. and Valacich, J.S. (1993). Computer Brainstorms: More Heads are Better Than One. *Journal of Applied Psychology*, 78, 531-537.
- DeSanctis, G. and Gallupe, R. B. (1987). A Foundation for the Study of Group Decision Support Systems. *Management Science*, 33, 589-608.
- Deutsch, M. and Gerard, H. (1955). A Study of Normative and Informational Influences upon Individual Judgement, *Journal of Abnormal and Social Psychology*, 51, 629-636.
- Dickson, G. W., Partridge, J. L. and Robinson, L. H. (1993). Exploring Modes of Facilitative Support for GDSS Technology. *MIS Quarterly*, 13, 173-194.
- Diehl, M. and Stroebe, W. (1987). Productivity Loss in Brainstorming Groups: Towards the Solution of a Riddle. *Journal of Personality and Social Psychology*, 53, 497-509.
- Diehl, M. and Stroebe, W. (1991). Productivity Loss in Idea-generating Groups: Tracking down the Blocking Effects. *Journal of Personality and Social Psychology*, 61, 392-403.

- Duncan, A. J. (1955). *Quality Control*. Richard D. Irwin, Inc., Homewood, Illinois.
- Festinger, L. (1954). A Theory of Social Comparison, *Human Relations*, 7, 117-140.
- Gallupe, R. B. and DeSanctis, G. (1988). Computer-Based Support for Group Problem-Finding: An Experimental Investigation. *MIS Quarterly*, 10, 277-296.
- Gallupe, R. B., Dennis, A.R., Cooper, W.H., Valacich, J.S., Bastianutti, L. and Nunamaker, J. (1992). Electronic Brainstorming and Group Size. *Academy of Management Journal*, 35, 350-369.
- Gallupe, R. B., Cooper, W. H., Grise, M. and Bastianutti, L. M. (1994). Blocking Electronic Brainstorms. *Journal of Applied Psychology*, 79, 77-86.
- Gallupe, R. B., Cooper, W. H. and Pollard, S. (Forthcoming in 1998). Anonymity and Deviance. *Small Group Research*.
- Goethals, G. and Zanna, M. (1979). The Role of Social Comparison in Choice Shifts, *Journal of Personality and Social Psychology*, 37, 1469-1476.
- Grise, M. and Gallupe, B. (1994). Using Integrative Complexity Theory to Examine the Information Overload Problem in Face-to-Face Electronic Meetings. *ASAC Information Systems*, 15, 27-41.
- Harnet, Donald L. (1982). *Statistical Methods Third Edition*. Addison-Wesley Publishing Company, Menlo Park, California.
- Hendrick, Clyde. (1981). *Group Processes and Intergroup Relations*. Sage Publications Inc., Newbury Park, California.
- Hendrick, Clyde. (1987). *Group Processes*. Sage Publications Inc., Newbury Park, California.
- Hogg, M. and Abrams, D. (1988). *Social Identifications*. Routledge, New York.
- Huber, G. P. (1984). Issues in the Design of Group Decision Support Systems. *MIS Quarterly*, 8, 195-204.
- Janis, I.L. (1982). *Groupthink*. Houghton Mifflin, Boston.
- Jessup, L. M., Connoily, T. and Galegher, J. (1990). The Effects of Anonymity on GDSS Group Process with an Idea-Generating Task. *MIS Quarterly*, 14, 313-321.
- Kelman, H.C. (1961). Processes of Opinion Change. *Public Opinion Quarterly*, 25, 57-78.

- Kiesler, C.A. and Kiesler, S.B. (1969). *Conformity*. Addison-Wesley, MA.
- Kiesler, S. (1978). *Interpersonal Processes in Groups and Organizations*. Harlan Davidson Inc., Illinois.
- Kiesler, S. and Sproull, L. (1992). Group Decision Making and Communication Technology. *Organizational Behavior and Human Decision Processes*, 52, 96-123.
- Kraemer, K. L. and King J. L. (1988). Computer-Based Systems for Cooperative Work and Group Decision Making. *ACM Computing Surveys*, 20, 115-146.
- Kravitz, D.A. and Martin, B. (1986). Ringlemann rediscovered: The Original Article. *Journal of Personality and Social Psychology*, 50(5), 936-941.
- Kroon, M. (1992). *Effects of Accountability on Groupthink & Intergroup Relations*, Thesis Publishers, Amsterdam.
- Leitenberg, H. (1990). *Handbook of Social and Evaluation Anxiety*. Plenum Press, New York.
- Martocchio, J. J. and Webster, J. (1992). Effects of Feedback and Cognitive Playfulness on Performance in Microcomputer Software Training. *Personnel Psychology*, 45, 553-578.
- McCartt, A. T. and Rohbaugh, J. (1989). Evaluating Group Decision Support System Effectiveness: A Performance Study of Decision Conferencing. *Decision Support Systems*, 5, 243-253.
- McDavid, J.W. and Harari, M. (1968). *Social Psychology: Individuals, Groups, and Societies*. Harper & Row, New York.
- McGrath, J.E. (1984). *Groups: Interactions and Performance*. Prentice-Hall, New Jersey.
- McLeod, P. L. and Liker, J. (1992). Electronic Meeting Systems: Evidence from a Low Structure Environment. *Information Systems Research*, 3, 195-223.
- Milgram, S. (1974). *Obedience to authority: An experimental view*. Harper and Row, New York.
- Miller, S. (1973). Ends, Means and Galumphing: Some leitmotifs of play. *American Anthropologist*, 75, 87-98.
- Niederman, F., Beise, C.M. and Beranek, P.M. (1996). Issues and Concerns About Computer-Supported Meetings: The Facilitator's Perspective. *MIS Quarterly*, 14, 1-18.

- Northcraft, G.B. and Neale, M.A. (1990). *Organizational Behaviour: A Management Challenge*. The Dryden Press, Chicago.
- Norusis, Marija J. (1994). *SPSS 6.1 Guide to Data Analysis*. Prentice Hall, Englewood Cliffs, New Jersey.
- Nunamaker, J.F., Applegate, L.M. and Konsynski, B.R. (1988). Computer-Aided Deliberation: Model Management and Group Decision Support, *Journal of Operations Research* (November-December).
- Osborn, A. (1957). *Applied Imagination*. Scribner, New York.
- Payne, S. (1957). *The Art of Asking Questions*, Princeton U. Press, 214-237.
- Peter, J.P. (1981). Construct Validity: A Review of Basic Issues and Marketing Practice, *Journal of Marketing Research*, 18, 133-145.
- Sambamurthy, V. and Poole, M. (1992). The Effects of Variations in Capabilities of GDSS designs on Management of Cognitive Conflict in Groups, *Information Systems Research*, 3, 224-252.
- Sears, D.O., Peplau, L.A. and Taylor, S.E. (1991). *Social Psychology*. Prentice Hall, New Jersey.
- Singh, D.T. and Ginzberg, M.J. (1996). An Empirical Investigation of the Impact of Process Monitoring on Computer-Mediated Decision-Making Performance. *Organizational Behavior and Human Decision Processes*, 67, 156-169.
- Simon, H.A. (1957). *Administrative Behavior*. MacMillan, New York.
- Steiner, I.D. (1972). *Group Process and Productivity*. Academic Press, New York.
- Tull, Donald S. and Hawkins, Del I. (1980). *Marketing Research: Measurement and Method*. MacMillan, New York.
- Turner, J. (1991). *Social Influence*, Open University Press, Milton Keynes.
- Turoff, M., Hiltz, S. R., Bahgat, A. N. and Rana, A. R. (1993). Distributed Group Support Systems. *MIS Quarterly*, 12, 399-417.
- Valacich, J.S., Dennis, A.R. and Nunamaker, J.F. (1992). Group Size and Anonymity effects on Computer Mediated Idea Generation. *Small Group Research*, 23, 49-73.

- Valacich, J.S., Dennis, A.R. and Connolly, T. (1994). Idea Generation in Computer-Based Groups: A New Ending to an Old Story. *Organizational Behavior and Human Decision Processes*, 57, 448-467.
- Valacich, J.S., Wheeler, B.C., Mennecke, B.E. and Wachter, R. (1995). The Effects of Numerical and Logical Group Size on Computer-Mediated Idea Generation. *Organizational Behavior and Human Decision Processes*, 62, 318-329.
- Vinokur, A. and Burnstein, E. (1974). The effects of partially shared persuasive arguments in group-induced shifts: A group problem-solving approach. *Journal of Personality and Social Psychology*, 29, 305-315.
- Wallach, M., Kogan, N. and Bem, D. (1964). Diffusion of Responsibility and Level of Risk Taking in Groups, *Journal of Abnormal and Social Psychology*, 68, 263-274.
- Watson, R., Desanctis, G. and Poole, M. (1988). Using a GDSS to Facilitate Group Consensus: Some Intended and Unintended Consequences. *MIS Quarterly*, 12, 463-478.
- Watson, D. and Friend, R. (1969). Measurement of Social-Evaluative Anxiety, *Journal of Consulting and Clinical Psychology*, 33, 448-457.
- Webster, J. and Martocchio, J. (1992). Microcomputer Playfulness: Development of a Measure With Workplace Implications, *MIS Quarterly*, 16, 201-226.
- Webster, J. and Martocchio, J. (1993). Turning Work into Play: Implications for Microcomputer Software Training, *Journal of Management*, 19, 127-146.
- Wheeler, S. (1994). *Group Processes: A Developmental Perspective*, Allyn and Bacon, Boston.
- Wortman, C.B. and Loftus, E.F. (1988). *Psychology*. Alfred A Knopf, New York.
- Zajonc, R.B. (1965). Social Facilitation, *Science*, 149, 269-274.
- Zander, A. (1982). *Making Groups Effective*, Jossey-Bass Publishers, San Francisco.

Appendix A

Number of Participants

In order to determine the number of participants required in this study, an analysis of similar research was conducted. Through this analysis it was found that the critical effect sizes for performance in comparable experiments ranged from .38 to .57, with the majority of studies relying on a critical effect size (Δ) somewhere in the 50's. Based on this analysis a medium Δ of .53 was selected.

Calculating the sample size:

Using a one-tailed t-test at a 5% confidence level, and an 80% power level with $\Delta = .53$, the formula indicates $n = 24$ participants per group.

For this study, the hypotheses that examine two groups (H1(a), H2, H3) required 24 participants in each of the groups (anonymous and identified). For hypothesis H1(b), where there will be four groups considered, there will be considerably less power involved (approximately 50%).

Appendix B

The Order of Contrived Responses

Response category is indicated in *italics*.

Weekly feature column in local newspaper - highlight achievements (research, student and faculty achievements). *1*

Specialize in only certain faculties that Carleton is well known for, i.e. journalism and engineering (aerospace). *2*

Provide more community services(student volunteers doing good deeds in the area). *4*

Target a whole new market - adult re-education instead of kids from high school. *2*

Start an affiliation with other academic institutions, i.e. early childhood education at Algonquin with Psychology at Carleton. *2*

Increase entrance marks to 80's for all programs. *2*

De-emphasize pure arts program. *2*

Sponsor a national academic examination with scholarships as prizes. *4*

Eliminate undergrad programs and become strictly graduate and research focused. *2*

Require all students to own a PC before even considering to admit them. *3*

Advertise on TV. *1*

Mandatory retirement at 55 for all faculty and staff - keep them fresh and current. *5*

Research what influences prospective students instead of relying on in-house "experts". *3*

Remove all students unable to obtain at least a B average - improve the quality of students graduating. *2*

Adopt a widespread use of co-op to give more exposure to prospective employers. *3*

Have serious repercussions for students who fail more than 3 courses in the four years (3 strikes and you're out!). *2*

Create a better pub on campus to draw prospective students. *4*

Allow students to comment on faculty, have repercussions for unfavorable reviews. *5*

Eliminate tenure. *5*

Purchase Lynx Stadium (i.e. Corel Centre). *1*

Celebrity affiliation - endorsements from the likes of Mike Cowpland and Dan Ackroyd. *1*

Create some winning athletic teams in highly visible sports(e.g. football and hockey). *4*

Appendix C**INSTRUCTIONS**

On the next two pages you will see a number of statements about group work and your participation in a group situation. Group situations can be those that you have participated in at work or at school. Please indicate the extent to which you agree or disagree with each statement, by circling a number from 1 to 5 according to the following scale.

	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
1. Working in groups results in a better product than working alone.	1	2	3	4	5
2. Better decisions are made by groups than by individuals working alone.	1	2	3	4	5
3. When working in a group, individual credit for ideas is not necessary.	1	2	3	4	5
4. Groups are more time efficient than are individuals.	1	2	3	4	5
5. I feel comfortable interacting in a group with my peers.	1	2	3	4	5
6. I feel confident speaking and expressing myself in groups.	1	2	3	4	5
7. I enjoy interacting and discussing work issues with groups of my peers.	1	2	3	4	5
8. When contributing to a group discussion, I am cautious about what I say.	1	2	3	4	5
9. When speaking in groups, I often feel nervous or anxious.	1	2	3	4	5
10. When interacting in groups I often feel pressure to participate.	1	2	3	4	5
11. When participating in a group, I feel that other group members are evaluating my contributions.	1	2	3	4	5
12. A group member's intelligence is reflected by their contributions.	1	2	3	4	5
13. In a group situation, my contributions are well thought out.	1	2	3	4	5

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
14. I often actively participate in group meetings.	1	2	3	4	5
15. In a group situation I often want to say something, but cannot seem to express it.	1	2	3	4	5
16. In a group situation I often want to say something, but cannot seem to find the right time to join into the conversation.	1	2	3	4	5
17. When I speak in a group, others tend not to listen to me.	1	2	3	4	5
18. In a group I often lead the discussion.	1	2	3	4	5
19. When in a group, I prefer to sit quietly and listen.	1	2	3	4	5
20. I prefer to support and encourage others' suggestions, rather than come up with my own.	1	2	3	4	5
21. I find when working in a group, that the other group members' suggestions trigger ideas for me.	1	2	3	4	5
22. In a group situation I often feel inhibited.	1	2	3	4	5
23. When in a group I feel more comfortable expanding on others' ideas as opposed to coming up with the original idea.	1	2	3	4	5
24. When in a group I find that I often challenge others' ideas.	1	2	3	4	5
25. When in a group I avoid conflict in a group whenever I can.	1	2	3	4	5
26. When in a group I will justify and stand by my original thoughts if they are challenged.	1	2	3	4	5
27. When in a group I find that I am easily swayed by the opinions of others.	1	2	3	4	5
28. When in a group I must be thoroughly convinced to adjust my thinking.	1	2	3	4	5

Please respond to the following questions by circling the T if you agree with the statement or the F if you disagree with the statement. Read each statement and circle the answer which seems to fit you best.

	TRUE	FALSE
1. I rarely worry about seeming foolish to others.	T	F
2. I worry about what people will think of me even when I know it doesn't make a difference.	T	F
3. I become tense and jittery if I know someone is sizing me up.	T	F
4. I am unconcerned even if I know people are forming an unfavorable impression of me.	T	F
5. I feel very upset when I commit some social error.	T	F
6. The opinions that important people have of me cause me little concern.	T	F
7. I am often afraid that I may look ridiculous or make a fool of myself.	T	F
8. I react very little when other people disapprove of me.	T	F
9. I am frequently afraid of other people noticing my shortcomings.	T	F
10. The disapproval of others would have little effect on me.	T	F
11. If someone is evaluating me I tend to expect the worst.	T	F
12. I rarely worry about what kind of impression I am making on someone.	T	F
13. I am afraid that others will not approve of me.	T	F
14. I am afraid that people will find fault with me.	T	F
15. Other people's opinions of me do not bother me.	T	F
16. I am not necessarily upset if I do not please someone.	T	F
17. When I am talking to someone, I worry about what they may be thinking about me.	T	F

18. I feel that you can't help making social errors sometimes, so why worry about it.	T	F
19. I am usually worried about what kind of impression I make.	T	F
20. I worry a lot about what my superiors think of me.	T	F
21. If I know someone is judging me, it has little effect on me.	T	F
22. I worry that others will think I am not worthwhile.	T	F
23. I worry very little about what others may think of me.	T	F
24. Sometimes I think I am too concerned with what other people think of me.	T	F
25. I often worry that I will say or do the wrong things.	T	F
26. I am often indifferent to the opinions others have of me.	T	F
27. I am usually confident that others will have a favorable impression of me.	T	F
28. I often worry that people who are important to me won't think very much of me.	T	F
29. I brood about the opinions my friends have about me.	T	F
30. I become tense and jittery if I know I am being judged by my superiors.	T	F

INSTRUCTIONS

The following statements ask for your feelings and impressions about the group experience you have just completed. For each statement please indicate the extent to which it describes your experience, by circling 1 to 5.

	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I felt free to enter all of the suggestions that came to mind.	1	2	3	4	5
2. I mentally evaluated a suggestion before entering it.	1	2	3	4	5
3. Communicating via the keyboard was difficult.	1	2	3	4	5
4. By communicating electronically I participated more than I normally would.	1	2	3	4	5
5. By communicating electronically I felt less anxious about what my peers thought.	1	2	3	4	5
6. By communicating electronically I felt less cautious about what I said.	1	2	3	4	5
7. By communicating electronically I felt that all entries were treated equally.	1	2	3	4	5
8. I did not feel that I could input at anytime.	1	2	3	4	5
9. I had no problem expressing my thoughts electronically.	1	2	3	4	5
10. I did not feel inhibited during the brainstorming session.	1	2	3	4	5
11. Other group members could identify which entries were made by me.	1	2	3	4	5
12. I came up with many original suggestions.	1	2	3	4	5

For each adjective listed below, please circle the number that best matches a description of yourself in the previous electronic brainstorming session.

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1. Spontaneous	1	2	3	4	5	6	7
2. Unimaginative	1	2	3	4	5	6	7
3. Experimenting	1	2	3	4	5	6	7
4. Bored	1	2	3	4	5	6	7
5. Flexible	1	2	3	4	5	6	7
6. Creative	1	2	3	4	5	6	7
7. Curious	1	2	3	4	5	6	7
8. Intellectually stagnant	1	2	3	4	5	6	7
9. Inquiring	1	2	3	4	5	6	7
10. Routine	1	2	3	4	5	6	7
11. Playful	1	2	3	4	5	6	7
12. Investigative	1	2	3	4	5	6	7
13. Constrained	1	2	3	4	5	6	7
14. Unoriginal	1	2	3	4	5	6	7
15. Uninventive	1	2	3	4	5	6	7
16. Inquisitive	1	2	3	4	5	6	7
17. Questioning	1	2	3	4	5	6	7

GENERAL INFORMATION

1. Please indicate your age. _____
2. Please indicate your gender.
Male _____ Female _____
3. Please indicate your status as a student.
Part-time _____ Full-time _____
4. Please indicate where you have participated in group work previous to this experiment. (Check all that apply)
Recreation _____ School _____ Work _____
5. Please indicate your program/field of study. _____

Exit Interview

	lots of problems				no problems
Did you experience any problems during your brainstorming session?	1	2	3	4	5

	hard				easy
Was the software easy to use?	1	2	3	4	5

	slow				fast
Did you find it slow?	1	2	3	4	5

What did you like about the software?

What did you dislike about the software?

Any suggestions on how to improve the software ?

Appendix D

Category	Type	Session	Response
1	a	1	Publish student newspaper in the community and in other schools
1	a	2	I don't think Carleton has a problem with its graduating students not doing well in society. I think the image problem is purely because of the low entrance grades. Therefore, advertising Carleton's positive points is all that is needed
1	a	3	The web is a great way to market Carleton as it targets a more global audience
1	a	4	Make local businesses accountable for the success of the university, with some funding for renovation buildings, improving the physical image of Carleton
1	a	5	Show the outside world that Carleton students are the ones getting hired in the workforce. Give a Carleton degree some credibility
1	a	6	Target advertising campaigns (young and cool ads) to outside of the Ottawa area
1	a	7	Carleton can show how previous graduates have fared and show other students that they can also do this
1	a	8	The new advertising campaign that Carleton has been doing in the recent months should continue. It shows Carleton is trying to better its public image
1	a	9	Find more corporate links to technology and publicize them as companies that believe in Carleton's capabilities
1	a	10	Encourage all faculty to be aware that they are all times representing Carleton and should try and do so in the most positive way they know how
1	a	11	Promote what Carleton has to offer in the local media
1	a	12	Profile our successful grads
1	a	13	How about making alumni success stories more prominent? Spotlight some of the more successful graduates (the idea being you can be like them too) in national magazines and newspapers
1	a	14	Advertise through direct mail
1	a	15	Make Carleton a household name by hosting celebrity tournaments, balls and sporting events
1	a	16	Concentrate on promoting and continuing to promote the unique programs @ Carleton such as journalism, public administration, ID, business, etc
1	a	17	Hopelully some of the athletic teams @ Carleton will come through prominently on the national (CJAU) level to provide general media exposure about the school
1	a	18	Continue with the theme of promoting past Carleton graduates that have gone on to success in their respective fields
1	a	19	Having a group to advertise the Carleton University
1	a	20	Organize conferences that deal with issues concerning teaching and students on both world and nation-wide levels
1	a	21	Position of University in relation to other universities and advertising more future programs
1	a	22	Publish a newsletter of success stories and sent it to possible Carleton candidates
1	a	23	Compile stats and present graduate placement ratios for Carleton programs
1	a	24	Get another magazine besides Macleans to do an article on Carleton showing its benefits
1	a	25	Get Carleton Alumni to give quotes and speak to promote Carleton
1	a	26	Advertise on television, good reasons to come to Carleton
1	a	27	Advertise in magazines as to what Carleton has to offer. This should be detailed description of each course. Example: Psychology one week, journalism the next week and so on
1	a	28	Last year I had an idea on how we could get high school students to come to this school. A calendar that would have a picture of a different student every month and have a little caption on the student saying what he/she is studying and his/her GPA
1	a	29	Carleton needs to have a generic poster that can be distributed to all high schools across Canada in guidance offices
1	a	30	A high school newsletter which Carleton high lights events, achievements, new programs (things that would be of interest to high school students) this paper would be distributed once every two months
1	a	31	Each individual faculty should have their own 'attractive' brochure like the engineering 'Reach for Excellence' highlighting the program and why Carleton?
1	a	32	Improve and/or make the public aware of CU's high academic standards
1	a	33	Promote itself towards the incoming first year students. Make a huge marketing effort to jump in the Maclean's rankings
1	a	34	Promote famous alumni
1	a	35	When students or faculty have noteworthy achievements try to get it in the newspaper as a story, not an ad, this may make it more important or credible
1	a	36	Carleton needs to highlight successful programs where placement rates are high and students in demand, through advertising
1	a	37	Promote the graduates who have achieved a successful career
1	a	38	Design and create a University of Carleton Journal whereby master and PhD students and faculty can publish their research. Promote this journal to international universities and in Canada
1	a	39	Promote university through the embassies
1	a	40	Also while it may be important to use the media to enhance our image, I believe the message ought to be a common one which all people associated with Carleton both possess and advocate
1	a	41	While it is important that we focus on our strengths, Carleton's publicity campaign also has to be more future relevant by gearing its image for the twenty first century. I.e. flashy campaigns
1	a	42	Setting up information kiosks in shopping malls would be a way of reaching a lot of traditional and non-traditional students, and would make us appear more approachable
1	a	43	Offer incentives for community leaders, counselors and students with give aways such as those found in the private sector
1	a	44	Possible to do more advertising across Canada. I know in Winnipeg I had to research Carleton on my own and my school had the data available
1	a	45	Offer current data about schools performance, such as competition, academically
1	a	46	Start up a better ad campaign present more on what school offers not on why they are going
1	a	47	Offer segments on the news. Canada wide that will highlight positive events and accomplishments
1	a	48	Do more with past graduates who have done well after. make their success known. show possibilities
1	a	49	Greater acknowledgment of (famous) Carleton alumnus - scholarships in their names
1	a	50	More PR for PhD theses - Carleton University Press - flashier books, more circulation, broader exposure
1	a	51	More speaking engagements by the President - clubs, high schools, community associations
1	a	52	Improved web site - (the current one is ineffective) on the library searches, access to grades, etc
1	a	53	Advertising overseas to attract foreign students
1	a	54	More radio ads promoting Carleton University on stations popular with people 18-20 years of age
1	a	55	Highlight Carleton's successes (people who are graduating who now hold important positions in industry). Ask them for quotes on their memories of attending Carleton
1	a	56	Carleton must promote its distinctiveness as a centre of learning in Ottawa, its connections with the high tech community. A well focused promotion campaign using the fundamentals of marketing would be an excellent start
1	a	57	Put together a 'dog and pony show' across the country to attract students and demonstrate why Carleton should be the university of choice
1	a	58	Do more promotional campaigns identifying the benefits Carleton has to offer
1	a	59	Have important alumni conduct information sessions for people interested in coming to Carleton
1	a	60	There is a large number of successful graduates, i.e. people who go on to find jobs in multinational corporations, etc. These statistics should be released to the public
1	a	61	Consider the idea of getting sponsors from successful companies like Nortel, and possibly giving scholarships to business, and engineering student in the company's name
1	a	62	Advertise for Carleton by making future employers and students aware of the successes
1	a	63	More advertising campaigns like the one's that I have been seeing which highlight former graduate's achievements
1	a	64	Change the University logo - it currently looks cheap and unprofessional

1 Stop embarrassing ourselves from the Maclean's rankings - it makes us look as though we have something to hide
 1 Let the market know how advanced Carleton is in the areas of technological communication
 1 Better advertisement of unique arts programs not available at many other universities - ie Cognitive Science and interdisciplinary studies
 1 Leave the Maclean's survey or force Maclean's to broaden the factors they look at to judge universities
 1 Advertise extensively in other provinces promoting high quality programs
 1 Look into better advertising plan than the current one to attract high school students
 1 We should really make known who our alumni are to show people what this school can produce - Jane Gilbert, Michael Compend, etc
 1 Have showings of student projects from Architecture and Industrial Design - that's where the proof of our talent is
 1 Letting people know that we have an Internet system and that the Ottawa FreeNet is based at Carleton and we are really cutting edge in terms of our use of information technologies
 1 Making people aware when Carleton students are in co-op positions that they are from Carleton so people know where to come back to find them when they graduate
 1 Promote Carleton programs on television
 1 Use media coverage to promote recognition and other achievements by Carleton students
 1 Magazine ads in journals that are of relevance to our degrees (Psychology Today)
 1 Celebrity endorsements from famous alumni
 1 Try to get the local media, especially the Citizen, to have a more unbiased view of Carleton - invite the editors to be part of the journalism program - brown nose the media
 1 Continue with the great radio ads
 2 Carleton should specialize in fewer types of degrees and cooperate more with Ottawa U - This would permit higher quality within existing budgets
 2 Increase the emphasis on graduate work
 2 I think that Carleton should eliminate its weak departments, and specialize more
 2 To improve Carleton's image I think we need to introduce some professional schools - For example a law school, a faculty of education, etc - If we look at some of the best universities in Ontario, their reputations come from having professional schools
 2 Eliminate all arts programs
 2 Have dynamic courses, (new wave of education) with dynamic teachers to teach them
 2 By becoming a university that is more concentrated in the courses or programs that it is best known for
 2 They should have more career programs like you would find at college
 2 Carleton should concentrate more on programs that will be technologically advanced for the future - Computers, robotics, etc
 2 Seek out more research for the undergrad students like Industrial Design's Black and Decker projects
 2 Attract students with higher averages coming out of high school
 2 Package programs in a way that would make them more attractive (ie Criminology)
 2 I feel that the open door policy that Carleton takes should be explained more clearly - Meaning that they should make people realize that sure it is easy to get into Carleton, however it hard to stay in
 2 Increase the percentage needed to get into certain programs
 2 Once in higher years, start to strictly enforce attendance, which would encourage more people to attend regularly and also weed out the less enthusiastic
 2 They should also provide classes that help people develop specific skill within the field they have graduated
 2 Focus strictly on just a few of the University's best departments (such as journalism and engineering) and weed away from the Arts where entry marks are usually lower anyway - Promote what Carleton is best at and get rid of the rest
 2 Raise entry level grades - stop the open door policy which brings down the average
 2 Lower highschool grades and large class sizes
 2 Portray Arts as Geography, or Public Admin or History not just purely the arts
 2 Re-evaluate the core requirements for all faculties, and maybe assign some computer courses to be core to all students - Another course could be on inter-personal skills and research procedures
 2 Specialize in some new areas and more exchange programs
 2 Make more popular university programs to the high school students
 2 Raise the entrance average
 2 Lose some of the programs that don't have a great reputation and are offered at other universities and concentrate on stuff like journalism, engineering and international business and try to get some corporate involvement in these types of programs
 2 Focus on emphasizing Carleton's BIG NAME Programs like Journalism and International Business
 2 Raise entrance grades from the high 60's to 75-80 - This will hopefully eliminate the last chance U name
 2 Raise the entrance grades for residence to get rid of the students who are just there to party for a year!!
 2 Raising acceptance grades so not everyone that applies gets in
 2 Instead of marking on a grade system a b,c change the marking scheme to percentiles or where you stand among your fellow classmates and only let the top 50% pass this will increase the competition
 2 Emphasize C U 's strengths, accounting, journalism, etc where we have received positive recognition
 2 Provide more real world courses to students by polling private and public sector on what requirements they are looking for in prospective employees
 2 Increasing the minimum academic requirements to enter might make the school more challenging to get into
 2 In the department of science, have labs that last entire afternoons or even a whole day (instead of 3-4 hours) - I think that would be more realistic
 2 CU is pretty well positioned to focus on degrees that lead to specific jobs - engineering, computer science, accounting, all of these are very much job related, the university could position itself as a place to get a degree that will lead to a job
 2 Implement courses such as intro to university to help with adjustment to life - especially if we are increasing GPA to help those who want to be here
 2 Raise academic requirements
 2 Joint projects with communities in the Ottawa/Eastern Ontario area - financed by corps (Carleton architects designing a community centre paid for by Minto)
 2 Raise the entry marks required to enter Carleton
 2 Focus on certain particular strengths instead of a wide range of suspect areas
 2 Increase graduate courses in order to attract undergraduates from other universities (advertise these courses at other schools)
 2 The first thing Carleton should do is begin at the grassroots level by weeding out the criteria it uses for entrance
 2 The university should decide on where its competencies are and focus on these to build up image
 2 Raise acceptance marks
 2 Have a teacher's college and law school directly affiliated with Carleton
 2 Increase the minimum average required for certain programs
 2 Maybe this sounds crazy but - "If you can't beat 'em join 'em" - become more of a technical training facility and leave the theoretical stuff to Ottawa U
 2 Continue to add new relevant programs such as international business to give Carleton image as innovative university
 2 Bring in the Nation's capital concentrate on degrees and programs that work on the national (international) level and work to perfect them

2	1	Have smaller classes in first and second year
2	1	Lecturers should be offered paid time to work on writing books about their particular subjects, research time should be considered to be part of their job. This will help to publicize Carleton's teaching body and show them as leaders in their field
2	1	Raise entrance marks to get into programs like business and engineering. low acceptance marks undermine the perceived quality of the program
2	1	Loose arts programs like religion and the classics that no one is interested in
3	8	School of Journalism (among the best) should cooperate with the private sector (newspapers/TV) this concept should be applied to as many faculties as possible ie demonstrate our abilities
3	8	Encourage students (with existing grants/scholarships) to start their own businesses and new ventures success will improve our reputation, failure will show the truth
3	8	Send representatives out to high schools to give talks about Carleton's strengths
3	8	Get more local companies involved with Carleton, and create linkages with them and the students
3	8	I know they don't have the money, but improving some of the classrooms and buildings to make them more modernized would be a great help!
3	8	Sending more students out to different research conferences will probably help
3	8	Don't let everyone with 6 OAC's in the university, or at least provide some sort of incentive for intelligent high school students to come to Carleton
3	8	Remodel our university to resemble the successful ones in the U.S., give potential students something new and exciting never seen before in Canada
3	8	Carleton should provide more hands on training like you would find at Agorquin
3	8	Get rid of the 3 year BA
3	8	Admit students to honours BA only with the option of 3yr after 1st year completed
3	8	Increase scholarship funds to compete for better students
3	8	Change our name
3	8	Offer more opportunities for students to get practical work experience, co-op, placements
3	8	Keep offering scholarships to 80%, and above students, even increase them
3	8	Offer book awards (money) to students who help out in the community
3	8	Make the student card an OC Transpo Bus Pass
3	8	Having students take a test in order to get into the university. Similar to the States
3	8	Expand in our faculties, perhaps start including teacher's college and medicine
3	8	Carleton's faculties should also interact more with the work force in order to provide job listings for students with higher averages. This may provide incentives for students
3	8	Perhaps increase tuition in order to eliminate the students not so keen on coming to university
3	8	What about an alliance with Ottawa University, making a mega-university with double the size, money, curriculum, staff, resources, etc
3	8	Lower tuition
3	8	Encourage more international students to attend, they tend to have higher marks and will improve Carleton's reputation for excellence
3	8	Provide incentives for performance. Tuition lowers by 5% for every 5% your grade point average is above the mandatory minimum
3	8	Install a computer on every desk in the library
3	8	Generate more community cooperation between the university/local companies/government with regard to Cooperative programs (work experience before graduation)
3	8	Make sure the library is adequately stocked - relevant and current important literature in respective fields
3	8	Decrease the size of the class. Gain reputation and improve the ranking of the university
3	8	Make decisions that affect enrolment in advance eg the rugby team being cut from athletics, students transferring elsewhere and then the program being re-installed in the fall
3	8	Creating more internship programs and more co-op opportunity
3	8	Create more scholarships for students abroad and not use the scholarship to attract students from high schools
3	8	Offer more scholarships and other motivations (rewards) programs
3	8	Increase co-op programs with local businesses
3	8	Get more corporate scholarships to increase the quality of facilities (ie computer, lab equipment)
3	8	We can send representatives into high schools around the region to talk to the students that may be entering university and clarify some of the myths about Carleton. We can explain why Carleton has a low entering average and how it can be a benefit!
3	8	Encourage potential students to visit campus and attend workshops and lectures, in order for them to see first hand what Carleton has to offer
3	8	I think we can improve Carleton's public image by not accepting so many high school students who have such low grades. That's my first point
3	8	We need to get out of debt and increase the amount of money we put into this university while trying to keep tuition lower than other Ontario universities
3	8	Smaller classes always helps
3	8	Make sure the money we spend for tuition and CUSA is being spent properly and put more of it into courses
3	8	Get more students involved in promoting the university because if they feel they are a part of what goes on they are more likely to speak well of it and work for a more reputable school
3	8	Co-op programs would be a good idea to get our students out in the job market and more recognized by employers
3	8	Corporate Sponsors may change the image of the Univ. and also pull it out of its financial troubles
3	8	Why don't we give more scholarships for great students and I do not mean only \$2000.00 but pay their entire school year and books. How could they say no to that?
3	8	Lowering tuition costs
3	8	I don't know if they do or not but if they do cut back on giving scholarships to athletes because a lot of stupid people make it into university that way
3	8	More co-op programs are necessary especially in Commerce we need to stay competitive with other universities and make ours a full co-op option
3	8	Really rely on feed back from high school students - surveys, telephone questions a lot of our image comes from the message or first contact that high school students receive from us
3	8	Greater alliances with private companies
3	8	Greater opportunities for financial aid may attract more students (bursaries, scholarships)
3	8	More information sessions sending current or past CU students to high schools
3	8	Consider privatizing certain faculties or degrees
3	8	Making some sort of coop program available, (the Waterloo) would be nice
3	8	Smaller classes (reduce the prof to # students ratio)
3	8	Bring in well known people to give lectures more often
3	8	Aim at attracting specific kinds of people rather than being an institation of general higher learning (fine arts, journalism, business, without having a social science faculty that encompasses many different disciplines)
3	8	Invite guest lecturers to student events
3	8	Have fewer student professors. In most schools, 1st year students rarely come in contact with a real professor. This would increase the caliber of the teaching
3	8	Try to keep track of grads careers, let people know how successful Carleton grads are
3	8	Co-op is definitely important, since companies that have success with a University tend to favour their grads
3	8	These days, a university can't be known for being everything to everyone. Carleton needs to develop an image, a focus
3	8	Need to develop a coordinated response to MacLeans issue either by participating, addressing the issues or some off-the-wall response

3	Internal issues are important: the university has to start focusing on the quality of its programs and of the education received. For instance, CU finance and accounting programs are known to be tough and turn out good students. Apply it to all programs.
3	Increase correlation between enrolment and funds available for specific courses and departments. (Let the fittest) programs survive.
3	Increase electronic presence and electronic delivery of courses.
3	Increase research groups and the profile of those groups. A university known for outstanding research successes always attracts lots of good students.
3	Improve standards required to continue in a degree program. Advertising below average students to graduate make the degrees less important in the eyes of employers.
3	Invite colleagues from private business and HR departments to provide input on the design of course curriculum.
3	Make more funds available for scholarships to high-merits graduating high-school students. The success of these students in the long term and their public achievements will bring favourable attention to Carleton.
3	The existing administration seems bloated and inefficient. It's time to do a business process re-engineering on CU to eliminate unnecessary bureaucracy and improve service to the student.
3	Resources should be improved, e.g. computer facilities, library should have more journals (I often find myself going to U of O because the Carleton library does not have them), graduate facilities (e.g. offices and computer room).
3	Put resources into faculty so they can publish their research in more international journals.
3	Offer more popular careers, e.g. Law and medicine (this is where the money is from the government).
3	Offer scholarships to exceptional students in developing countries.
3	Offer incentives to well known and respected professors from other universities in Canada or abroad to join Carleton University.
3	Promote business students to the business community in the area, offer a kind of stage after the school program is finished as an extension of the programs offered by the school.
3	Improve campus aesthetics.
3	Co-op.
3	Higher level of corporate sponsorship.
3	More interaction with industry.
3	Reduce corporate licensing (ie. capital foods) to allow more student freedom for social activities (parties).
3	Loose Scotia Bank (offer some variety).
3	Set up a community of students or faculty to discuss school opportunities to those who are considering it. If real students give opinions, image perceived as real.
3	Improve facilities (run down buildings, comparably to other universities).
3	Scholarships with focus on specialized degrees - name recognition with others who have excelled in these fields.
3	Introduction of co-op programs - not just placements - allows for students to impress managers/members of community.
3	Corporate sponsorship of selected programs (ie. aerospace) as long as the corporation does not write the agenda/program.
3	Financial accountability - balanced budgets.
3	More residences - perhaps guaranteed room for first year students.
3	Hit the business industry to find out areas of job growth and push these areas to potential students, thus focusing on future job prospects.
3	Set up more co-op programs which could be used as student incentives.
3	Push the strengths of Ottawa itself (Capital, canal, etc.) to students outside the province.
3	Have successful alumni students visit high schools to explain programs which were useful in getting their jobs.
3	Shield control over money given to welfare and low income students to hopefully get the funds to students who really need it.
3	Increase co-op programs to help students further their work experience while still in school.
3	Increase scholarships for second, third or fourth year students for achieving high grades while at Carleton.
3	There may be some opportunities to provide training to public and private sector decision makers.
3	Partner institutions in other nations capital cities.
3	Target students that would normally attend college.
3	Hire image consultants.
3	Provide more scholarship money to attract the best of the best both nationally and internationally.
3	Focus on becoming a teaching university and gradually move away from research.
3	Reduce the costs of books and other incidentals to attract those who may go to college.
3	Create fixtures on campus that attract international conferences and exposure.
3	Provide distance learning services.
3	Concentrate on making the students have a goal, rather than some students in school just to get any degree they can.
3	Affiliate with businesses in Ottawa-Carleton area.
3	Company affiliation - programs in line with industries needs and/or sponsored by industries. I.e. High Tech MBA sponsored by Intel.
3	Introduce more co-op programs.
3	Use Ottawa U as a resource - make sharing of resources and unique programs between the two schools more prominent.
3	Make acquisitions and the maintenance of journal subscriptions a higher priority than the elimination of deficit etc.
3	Push for greater recognition of programs such as journalism, architecture and aerospace engineering.
3	Add more scholarships to attract students with BS and over averages.
3	Emphasize the value of an Arts degree in today's world where people seem to think the only jobs are in programming.
3	Have Carleton students promote themselves and Carleton to the community and future students.
3	Have stronger co-op programs in all areas of study.
3	Place more emphasis on the extensive exchange program at Carleton through Carleton International.
3	Re-build the food and housing service on campus to create an acceptable living arrangement.
3	Spend more money on the library so that it is more useful for students.
3	Increase the entrance requirements and introduce an interview based selection procedure so that it seems more like Carleton is hand picking students and are therefore most likely to be selecting the best.
3	Encourage more interaction with schools in the area so that students get a more personal feel for Carleton. This should be an ongoing process rather than just a last minute thing before entrance choices are made.
3	Maybe a tutoring service???
4	encourage more inter collegiate student competitions.
4	We also have to treat our own students better, even small things like departments being available for phone calls or being available for consultation. Treating our own students better will go a long way.
4	During frosh week, when there are many students who don't yet have a negative image of Carleton, staff around campus should be wearing Carleton t-shirts with catchy slogans. This gives a sense of Carleton pride (for all members of the community).
4	Spend some money on sports, nothing improves image like national coverage on TV.
4	Keep the students interested, with exciting interest groups, intramural sports, giving students a strong voice and if they are happy, the word will be spread.
4	Carleton should also provide more support for their first year students. They should go to the students before the students have to find help.

4	Encourage people who want to advance in their jobs or to create better careers for themselves to enroll at Carleton	6
4	Provide labors and support for the students who are not doing well so that they can graduate and succeed in life	7
4	Provide scholarships for students who excel in sports or in other areas so that they can attend Carleton	8
4	Strive to have one of the high profile sports such as football or basketball be a winning team (eg. win the Vanier Cup)	9
4	Promote more Carleton clothing and artifacts by making them cheaper for students to buy	10
4	Having successful team sports or athletes may promote pride in the university and attract sport stars and supporters to Carleton	11
4	Increase the number of bars on campus. High school students looking for a University do look at this kind of thing	12
4	Make the university more community based. Provide access (ie. to the library, sports facilities, etc.) to non-students who live in the area. This will provide a grassroots level of positive feelings towards the University	13
4	Make the student more accessible to the disabled	14
4	Let the student take place in the public context, in order to gain reputation	15
4	Give more respect and freedom to student because their voice will be one important factor	16
4	Increased extra-curricular sports	17
4	I heard that Midson offered to build a stadium for Queen's football team, but it was turned down. A high profile stadium on campus would benefit Carleton's image	18
4	Get students that come to Carleton with high grades to explain why they choose Carleton over other schools and programs	19
4	Involve students in the community, fund raising, etc. giving Carleton students a better reputation as "well doers" instead of "beer consuming Arts students"	20
4	Concentrate on the idea that Carleton is in Ottawa and it's a good city to go to university in	21
4	Highlight our internet facilities for all students, not many schools have free access	22
4	Put more money in sports to create school wide pride	23
4	Rent PC to students who do not have one	24
4	Have a PC available to all rez students	25
4	Offer awards or prizes to high school students during visits the book marks, posters, ball caps, calendars, cotton bags with logo - so that Carleton appears everywhere	26
4	Have students participate in more national and international contests (mock cases, trials, etc.)	27
4	More community involvement (highlight achievements of graduates)	28
4	Increase funding for varsity sports. Most first-year students will gain more pride in their school if it has a really good football or hockey team	29
4	Increase OC Transpo service to the school from all parts of the city. Many do not find Carleton to be very accessible	30
4	Paint all the concrete walks all over campus. (Sodagam is a very depressing shade of gray)	31
4	Start a jobs research office, who will compile and produce regular reports on availability of certain job categories. This office could become a resource for media, thus raising CU profile as the JOBS-U	32
4	Improve the gym facilities and invest on the men and women that represent Carleton University at sports events	33
4	Successful results in high profile varsity sports	34
4	Raise student contribution to surrounding community	35
4	Higher rewards and public recognition for students who achieve academic excellence as well as a high level of involvement in extracurricular activities	36
4	Continue improvements to buildings and outside areas for mobility-impaired students	37
4	Establish/improve relationships with area high schools - allow Gr. 13 access to library - make this their first choice for post secondary education	38
4	Improved road signage near university - let people know you're there	39
4	Improved athletic facilities	40
4	School Uniforms	41
4	Hold more public events to familiarize people with the campus	42
4	Offer subsidized child daycare for single parents	43
4	Lower parking prices!	44
4	Improve students security on campus	45
4	Spend time and money on the campus itself to help boost the image in the minds of those already here	46
4	Letting Carleton's party reputation simmer down by eliminating an on campus pub	47
4	Provide a larger variety of varsity sports	48
4	School spirit events that will boost the morale of those who may be falling victim to the negative public image that Carleton has	49
4	Open up campus for community events and use - day camps, discussion groups, exhibitions, etc.	50
4	Make better use of institutions and resources unique to Ottawa - ie Parliament, museums, archives, and galleries (better than in other university towns)	51
4	Celebrate successful student athletes from low-profile sports more	52
4	Challenge other universities such as Queens or U of T to public academic challenges each year	53
4	Invite people to come on campus to see it, that's why I came here	54
4	Get our students out and taking to the community; they are the best reflection of us	55
4	Allow the public to come to Carleton and see the advanced programs that are taking place	56
4	Have Carleton work more with the community in volunteer work, etc.	57
4	Put more emphasis on showing the community and possible future students what Carleton has done for past Graduates and how far their Carleton degrees have taken them	58
4	Create a varsity Hockey team	59
4	Encourage Carleton students to be more involved in the community in general - local charities, community work	60
4	Encourage students to get involved (either on a voluntary basis or a paid basis) outside of class in areas of their study eg Journalism students submitting articles to the Citizen	61
4	Start up a study program during the holidays before any major exams for high school students. The teaching staff at Carleton would teach the high school students and help them cram effectively for exams	62
4	Students should get more involved with the Ottawa South-Carleton communities - shenevane is a good start, but expand on that idea	63
4	Carleton merchandise on campus is too expensive for students to buy. Reduce the prices of that stuff for students	64
4	Change Ovens back into a place that students want to hang out in - Wednesday nights used to be huge!	65
5	Improve the quality of teachers	66
5	Bring in professors with new and innovative ways of teaching. This way students stay focused and involved	67
5	Train professors on how to present or teach, make this mandatory	68
5	Have respected international lecturers come to Carleton to give presentations on their specialty	69
5	Qualified professors	70
5	Eliminate boundaries between students and faculty members, and improve administrative and educational services	71
5	A good teaching staff with more experience and good relations with firms for placing students	72
5	Develop a student action committee that is not part of CUSA or RRRDA to meet with administration with feedback from students and hopefully develop more of a partnership with admin	73
5	Fire drills that cannot teach	74

5 Eliminate tenure
 5 Better screening of TAs and staff: get best quality education for the money you spend
 5 All professors should have to attend some form of teacher training (teachers college). There are some professors who are awful teachers
 5 Attract professors with strong track records
 5 Hire professors that students can understand, i.e. speak english fluently
 5 Try to lure some professors from an Ivy league school
 5 Give more weight to student evaluations in awarding tenure to professors (maybe after first year)
 5 Work on internal factors such as more efficiency in administration and the bookstore, etc. so that students will have favorable opinion of Carleton and pass it on
 5 Hire more younger professors. I know they will have less tenure which Maclean's would say is bad, but they will be the most up to date with a willingness to drive the university ahead instead of entrenching it in the past
 1
 6 Don't necessarily agree that entrance grades need to be raised any further - budgetary requirement for many students + Einstein did very poorly in high school
 6 Keep in mind both the school and the students are broke
 6 r.e. 15 - illegal because of age discrimination
 6 r.e. 20 absolutely
 6 r.e. 23 I agree, but average is too strict, r.e. 24 what kind of students are we trying to attract, we already have plenty of alcoholics
 6 r.e. 27 result is a teacher's strike r.e. 28 budget?
 6 I don't think that raising the entrance marks to 80 is necessary, 70 is fine. There is only so much raising marks will do for the university
 6 I think Carleton shouldn't abandon its philosophy of giving everyone a chance (I.e. I don't agree with number 18), even C students can make a good contribution to society
 6 Is this place really dead or is it just me? -)
 6 If you require all students to own a PC, you get into the problem of having to deal with a wide variety of platforms
 6 Along with operating systems etc.
 6 Secondly you would need a set of standards for the work submitted and what should you standardize on??
 6 That way Carleton can be presented to be on the cutting edge of research
 6 Hi there let discuss now. My name is Simon. I think the way to improve Carleton's public image are that, first, give more impression to public or we call it the media, the impression may be the quality of professors, the text book they choose and so on.
 6 A weekly feature column would be part of the solution but part of the image is the level of the students entering the program
 6 But the core of the students and thus the core of the revenue is from high school grads not adults
 6 If entrance marks were increased to the 80's, sure the public image would improve as to the level of students. But the lost revenue, lost jobs and research would portray a negative image
 6 Addition to #17, more seasonal lecturers - people from industry are often more current than a lot of profs
 6 The affiliation is a good idea but increasing entrance marks to 80s doesn't work. Even Queens doesn't have standards like that
 6 I think the winning sports idea is a good thing because it will eventually increase school spirit which benefits our image
 6 If Co-op programs are not viable economically internships or practicum unpaid would still get students out there in the job market
 6 It would be nice to see results from our course evaluations, there are some profs who are definitely either too intelligent to teach a course or just not effective teachers
 6 I like the idea of highlighting events in local newspapers, in this case we would be in people's face (so to speak) and would have to recognize the other good things that are related to Carleton
 6 I also like the idea about being in partnership with Algonquin. People need to learn skills (practical ones) for the workforce. I think mandatory courses in writing as a must so we can differentiate ourselves from other institutions
 6 I somewhat agree with trying to keep the serious students in school and the not so serious out. However, it is risky to kick-out students without asking what the problem is. We must have some compassion
 6 What do you think?
 6 I think that's ridiculous. Most students have a strict budget!
 6 In response to #10, I think also sponsoring more academic contests with other universities would also be good, especially when Carleton beats Queens
 6 In response to #8, I think this is good as long as there is still room for admission of special cases or mature students
 6 In order to have a successful sports teams, add programs in phys-ed, physiology, kinesiology
 6 I couldn't agree more with the suggestion for outside input. The "holy" lower approach to marketing and promotion traditionally used is getting really tired
 6 I think we do more harm by alienating underachievers who once expected will deliberately attempt to sabotage Carleton's image
 6 Definitely improve athletics: never heard of the Ravens back in Winnipeg, do they ever win?
 6 Better publicizing ground breaking research undertaken by Carleton's faculty and students. Also agree with John's comment on community services
 6 Better grounds, more activities for students, more emphasis on athletics and/or Carleton's teams and yes, a better pub!
 6 I like that age 55 retirement suggestion!
 1
 7 The ads found on the web site and the radio seem to cheapen the image that Carleton has
 7 The ads seem to indicate that Carleton is fishing for students. We are, but it might be a good idea not to make it that obvious
 7 You can't expect everyone to pay \$500 for the Microsoft software when the equivalent in UNIX is free
 7 While we're at it why don't we just by Ottawa U
 7 No fat chicks!
 7 I don't think the pub idea is the greatest for improving Carleton's image
 7 Require students to have a PC to go to a university is crazy. Who has the money to do that and whoever posted that should attempt to justify that idea. When they do it just doesn't work and it eventually eliminates a whole class of people
 7 I think that 55 is kind of early for retirement, 65 should be fine as long as they are not senile
 6
 8 Magazine and TV ads are not going to be the things that save Carleton, a good reputation is what will. A reputation is built by Alumni and word of mouth.
 8 Stop advertising on the radio.
 8 Encourage those who have not been in school for a few years to come back and provide the support that these students would need
 8 If we narrow degrees we narrow funds and reputation we must increase awareness of success in all programs
 8 Recognition of achievement is central, publicity of achievements is important
 8 Change Ottawa's climate so that it is summer like all year
 8 The graduate student is also an important factor to the Carleton's public image cause the jobs they get will affect others image
 8 What is perceived to be Carleton's image and what do you feel are the university's short comings?
 8 Compare Carleton with Ottawa U
 8 But I also think there is a problem with who has control over our image
 8 We need to increase Campus (student) spirit of this university. Improving our own perspectives of this place while we are students will eventually diffuse itself into general public.

8 Carleton must decide who its target market is and go after that market, focus on our strengths
 8 The main thing is to try to change everyone's belief's that Carleton is the last chance U
 8 Provide more information on the array of services CU provides students
 8 Carleton can do a lot to improve its public image. Lately it seems the school has been trying very hard to market itself in the media with radio commercials and billboard advertising. I think this is a step in the right direction
 8 Probably the most important aspect of improving Carleton's image I believe is creating an aura of success when Carleton is the topic of conversation
 8 Target markets in high demand
 8 Improve Carleton's image! How about starting with what is wrong with its image?
 8 Find a way to combat the label "last chance U". Even if we raise our grade requirements, it will be very difficult to lose that label
 8 Kick out students who beat up cab drivers and attempt to justify it in local newspaper articles
 8 Carleton's public image is improving through steady work, I think people are beginning to see through the Maclean's issue and realize what it is
 8 Show what a diverse place Carleton is attracting people from across the country and around the world, and how this marketplace of ideas results in a powerful form of education which students at Carleton can take advantage of
 8 Just let people know what we are doing, there is a lot going on at Carleton - good projects and research - that a lot of the public just don't know about
 8 Promoting higher spirit on campus
 8 Try and estimate Carleton basking by Carleton students
 8 Have the strong Carleton programs mentioned more often and concentrate on them
 8 Publicize any good things that happen in Carleton

Appendix E

Debriefing Letter

<Date>

Dear <Name>,

Recently you participated in an experiment involving an electronic brainstorming session conducted to obtain research material for a masters thesis. The study has now been completed and the details of the experiment can now be revealed.

During the brainstorming session you were told that you were participating with 3 other people, in fact, the other responses were provided by a standard set of input (i.e. there were no other participants). Some participants took part in sessions that were classified as anonymous (no names were attached to the entries) while others participated in identified session (first names were attached to the entries). Please rest assured that your responses remain strictly confidential. For data analysis purposes, all of your responses were stripped of any identifying features and were used for content only.

The main idea behind the research revolved around the notion that participant responses would vary according to the type of session participated in. For instance, when participants were active in an anonymous session, their level of participation would be greater than if they had participated in an identified session (i.e. if participants were identified their responses would be more restricted because they would be accountable for their input). If you have any questions, concerns or feedback that you would like to discuss, please feel free to contact me by leaving a message in my mailbox on the 7th floor of Dunton Tower in the mail room or on my email jfarmar@business.carleton.ca.

Thank you again for your participation.

Sincerely,

Julie Farmar

IMAGE EVALUATION TEST TARGET (QA-3)

APPLIED IMAGE, Inc
1653 East Main Street
Rochester, NY 14609 USA
Phone: 716/482-0300
Fax: 716/288-5989

© 1993, Applied Image, Inc., All Rights Reserved