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Face-to-face vs. computerized conferences : a controlled experiment, Volume II: Methodological Appendices

Computerized Conferencing & Communications Center


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**COMPUTERIZED CONFERENCING
& COMMUNICATIONS CENTER**

at

**NEW JERSEY
INSTITUTE OF TECHNOLOGY**

**FACE-TO-FACE VS. COMPUTERIZED CONFERENCES:
A CONTROLLED EXPERIMENT**

BY:

**STARR ROXANNE HILTZ, KENNETH JOHNSON, CHARLES ARONOVITCH,
and MURRAY TUROFF**

VOLUME II: METHODOLOGICAL APPENDICES

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RESEARCH REPORT NUMBER 12

**c/o Computer & Information Science Department
New Jersey Institute of Technology
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APPENDIX A

RECRUITMENT SPEECH USED BY ASSISTANTS

We are recruiting subjects for an experiment on group communication. We anticipate that this experience will be quite instructive and enjoyable, and will involve no personal risk. The sessions will be held in the afternoons in Beck Hall and will take from one to three hours. You will be paid \$2.75 per hour for the time you spend. I will be passing out sign up sheets if you wish to participate. Please list on the form ALL of the times that you COULD be available, although you will only participate for a single afternoon. An assistant will call you to arrange a particular day when you will participate.

Please fill out the form and return it to me now.

Thank you for your help.

APPENDIX C

DEBRIEFING GUIDELINE FOR TRAINING SESSIONS

The main function of debriefing after training is to relax the Ss, reinforce whatever fun that they have had (if they had fun!) with the system, and getting them back for the problem trials! The monitor should be warm, supportive and encourage ventilation of reactions. The Monitor should reassure Ss that the system is not as intimidating as it first appeared, and that Ss can do nothing to harm the system.

The following are some suggested areas one might consider:

--Were there any particular problems with the instructions?

--Are there still any areas of confusion outstanding?

--Do the Ss have any questions that they wish to ask of us?

--Are there negative feelings if the predominant tone is positive, and vice versa?

The Monitor should remind the Ss that they are expected to return for the problem conference, and will tell the Ss what date that is. Monitor will also tell Ss that an assistant will confirm the date and remind the S by phone.

The Monitor will emphasize that Ss should not talk about their experiences with others.

The Monitor will then pay the Ss and make sure that they sign the payment sheet.

APPENDIX D

DEBRIEFING GUIDELINE FOR RUNS

1. Thank subjects for their participation. Acknowledge that they are probably tired and restless, but suggest gently that this final few minutes of their time is extremely important for us.

2. Elicit general reactions to their experience. Try to elicit reactions from all subjects. Focus particularly on problems, misunderstandings of the directions, etc. Look for both positive and negative feedback.

3. Spend most time on the problem tasks. Try to discover whether or not they found them interesting, realistic, resolvable, etc. Ask if the group reached a consensus on either problem. Be particularly on the alert for the reactions of ALL subjects on this question. Often two or three members may respond that a consensus was reached and even state the presumed consensus. Check specifically if the silent members agree that a consensus has been reached, and if they respond affirmatively whether or not they agree with the consensus.

If a consensus has apparently been reached, ask each member if he or she agrees with it, and whether or not they think it is the best solution. Ask the members to STATE the consensus.

Focus on the differences that the Ss perceive between CC and F to F, and their reactions to the two modes.

4. Ask the subjects if they have any questions that they would like to ask us, and respond to their questions as honestly, completely, and briefly as possible.

5. Ask the subjects not to discuss their experience with anyone, particularly the problems that they were asked to discuss. **EMPHASIZE THIS!**

6. Pay the subjects, make sure that they sign the payment sheet, and once again thank them for their participation.

Other areas you may wish to explore in greater depth if time permits:-

--Whether or not Ss knew each other before this experiment

--How well they felt they got to know each other during the experiment

--What they perceived the difficulty was in dealing with the problem tasks, particularly issues related to leadership, structure, etc.

--Suggestions they may have for improvement

APPENDIX E
CONSENT FORMS SIGNED BY ALL SUBJECTS

To all experimental subjects, from Roxanne Hiltz

You have volunteered to take part in an experiment which has two parts. The first involves learning to use a computer terminal, and the second is on group decision making. The experiments, supported by the National Science Foundation, require that we obtain your written "informed consent" prior to participation.

The purpose of these experiments is to add to our knowledge about human learning and communication processes. There is no possible harm to you involved. However, you are free to withdraw from participation at any time.

Your behavior during the experiments will be recorded and/or observed. After you have completed your task, you will be asked to answer some questions. We will then be glad to answer any questions you have about the experiment. The main form of presentation of results will be statistical summaries. We may also quote a specific comment you make. You will not be individually identified in any of the reports of the results.

You will be paid in cash for your participation at the rate of \$2.75 per hour. Your signature below means that you have read and understood the above and agree to participate.

Print name _____

Sign name here _____

Date _____

APPENDIX F
GUIDELINES GIVEN TO ASSISTANTS

Room assignments and conference numbers for the day will be listed on the board in 206.

1. As soon as you arrive, start setting up terminals in all the proper rooms. Lock door behind you.

2. Sign-on procedure:

a) Dial 9-645-5552. Insert phone in modem (firmly) after having turned on both modem and terminal. Make sure Duplex switch is on FULL on modem, and PARITY is off on terminal (the down position).

b) Enter number and code (e.g., 902,two)

c) Accept any waiting private messages.

d) Erase scratchpad by entering +cnm, which will also put you in line 1 of scratchpad.

e) Start procedure to enter S's name by typing ++5,7 in line 1 of the scratchpad and pressing the RETURN key. This will result in a printing out of the present information. Answer y to "Modify public info?". It will print "Name?". Leave the terminal at this point until S is brought in.

f) When S is brought in, enter full name for the S and press the RETURN key; enter a nickname with a last initial if it says the name is in use or if it is a common nickname. If you have to start over because name is in use, start from ++5,7 again. Then skip other questions by doing a plus. Answer Y to "Okay to Modify?".

g) Then do +gc(conference number). We will start with 902 and use a different one for various runs. Thus on the first day, you would type +gc902,n. This puts S into conference 902 and skips the printing of conference status.

h) Now answer Y to "Accept New Items?", and seat the S at the terminal. Then leave the person and start the next subject, returning periodically during learning or practice to help them find and execute the proper instructions.

3. Each assistant will have responsibility for two or three rooms/Ss for each session. Take all two or three of your subjects to their rooms at once; let subject two watch what you do with subject one to allay anxiety.

4. The big problem here is if the Ss hit anything besides a + to send a comment or a 4 at "Conference Choice?" If they do, they will be thrown into "Initial Choice?" or some conference choice that they

do not know about, and the assistant will have to get them out of it.

a) If they get disconnected, depress telephone button. Redial 9:-645-5552. Sign on with number and code. Enter +gc90#,n.

b) If they get out of the conference, enter +gc90#,n.

c) If they get into some other conference choice (like "Comment Numbers?"), Do a minus. This should take you to conference choice.

5. Always carry clipboard with cases, questionnaires, etc., with you.

I. All Runs

1. Ss are to get refreshment and bathroom break after completing the first discussion and being taken to their individual rooms, if not there already. Instruct them not to talk to each other during break and to return within five minutes.

2. Questionnaires are to be distributed after both discussions are over.

3. Speech: "I know you probably feel that you have completed your job, but the most important part of the study for us comes next. We want you to answer some questions on your reactions to taking part in the discussions. Please note that the first part concerns your discussion of (PROBLEM) in (MODE), and the second part concerns your discussion of (PROBLEM) in (MODE). Please answer the questions as completely as you can. I will be back to collect them from you in a few minutes, and we will all get together to talk over your experiences."

4. Then return in 5 to 7 minutes, collect questionnaire, and escort your two or three people, together, to B405.

II. Face to Face Ranking Problem (Desert or Arctic)

1. Leave each S with a copy of the problem and a sheet of the items to be ranked, including a carbon.

2. While Ss are reading the problem, make sure that the recording equipment is turned on.

3. Check to make sure that initial ranking has been done correctly, when subject seems done (no duplications or omissions of rank). Leave original and carbon paper on S's desk; hand S the carbon copy to take to the discussion.

4. The two assistants should check with each other and co-ordinate the bringing of Ss to discussion site all at once. On the other hand, the checking of ranks is done for each subject as he/she completes.

5. After Ss have begun discussion, assistants will make copies of Ss' rankings, and return originals to rooms.

6. THERE WILL BE NO SMOKING IN OBSERVATION ROOM, if you choose to enter after delivering subjects to B405.

7. Stay alert to end of discussion; escort your Ss back to their respective rooms.

8. Check ranks before collecting them and proceeding to next

step (snack or final questionnaire).

III. CC Ranking Problem (Desert or Arctic)

1. Did they receive the problem?
2. Are they marking their rankings in pencil?
3. Did they enter +rank correctly? Are they responding correctly?
4. Are they receiving their begin discussion instructions when all complete rankings?
5. Did they enter their second ranking command and begin second ranking?

IV. CC Bales

1. The Monitor will alert you when an end discussion comment is sent during practice.
2. Make sure that all subjects finish their practice and enter comment immediately to get this and other waiting comments. Instruct them not to enter any more practice and to do a +look in approximately one minute to get the problem.
3. Make sure they are getting the problem when they should.

V. Face to Face Bales

1. Take Ss to individual rooms when all have arrived. Give them the instructions and the case to read.
2. While Ss are reading the cases, make sure the taping equipment is turned on.
3. The Ss are given 10 minutes to read the material. When ALL are finished, take all Ss together and assemble them in the experimental room.
4. At the end of the discussion, the assistants return the Ss to their respective individual rooms.
5. If the Ss have already done CC, they are given the questionnaires. If the Ss have not been in the CC condition, they are given coke and cookies and bathroom break. THEY SHOULD BE INSTRUCTED NOT TO TALK TO EACH OTHER DURING THE BREAK.

APPENDIX G

GENERAL INSTRUCTIONS FOR THE MONITOR

The Monitor's Role

I. Training Sessions

a) Remind assistants that the conference number for the Training Session is C912.

b) Insure that all 7 terminals have been set up, phoned in, and set to receive the new S's name, by entering a ++5,7 to modify the old information, after having done a +cnm to clear the scratchpad. Insure that all terminals are set to 120 margins by doing a +right120 in scratchpad, if necessary, and that all terminals have a red dot to indicate the 110 margin.

c) If necessary, procure copy of Assistant instructions (C961 CC's 283,284,308,307,306).

d) List on the blackboard the conference number being used that day, and which ID will be signed on in each room. Check off on blackboard as each room is filled.

e) When all Ss have arrived, the Monitor says:-

"Hello, I'm Dr. _____, and I am coordinating the group discussion today. Today we are going to have you engage in a new form of group discussion, which involves typing your comments into a computer terminal, and reading the comments of others that are printed out on your terminal. What we are going to do is to first show you a form which explains the conditions of your participation in detail and requests your written consent. Then an assistant will take you to your own terminal, and you will receive instructions about how to enter your comments into the written discussion and how to receive the comments of the others when you are ready for them."

f) The Monitor then reads through the written consent form with each subject.

g) The Monitor then asks the assistants to bring each subject up to a terminal, and checks off on the board as this is done.

h) The Monitor will then immediately insure that all consent forms have been filed.

i) After the Ss have been sent to their terminals, the Monitor will procure a monitor sequence and a printout of the Training instructions from the files (Monitor sequence is in C961CC301), note the time that the procedure started, and carefully follow C961CC301.

j) Monitor will also procure from the files a copy of System Response sheet. Monitor will check the number of users on line at the beginning, during the middle, and at the end of the Training

Session.

k) After the Training Session has been completed, and Monitor has noted the amount of time taken and filled out a report on the response of the system, the Ss will be debriefed (Debriefing Guide is in C961CC158) and told when they are to return for the Problem runs, and that they will be so notified by an assistant.

1) The monitor will then print out three double-spaced copies of the conference (+space 1 in scratchpad).

m) After all Ss have departed, and the Monitor is dead tired, the Monitor will make sure that all terminals have been locked up in the 4th floor equipment room, and that all offices which have been used are tidy and locked.

II. Problem Runs

a) General setup is same as above. See C961cc315,316 for locations. When all are present, the Monitor says:

"Hello, I'm Dr. _____, and I am coordinating the group discussion today. The last time you met, you all learned to use a computer terminal to communicate with each other by making comments in what is called a "computerized conference". Today, we are first going to give you five minutes of review and practice, until you all have your memories refreshed about how to use the necessary commands, such as +comment. Then, your group is going to have two problems to solve. The first you will solve by discussing it and attempting to reach consensus in a (CC or F to F) conference. Then you will have a short break. Then you will get a second problem to solve, by discussing it in a (CC or F to F) conference. Finally, we will ask you a few questions about your reactions, and get together again in order to pay all of you. As last time, you will be paid \$2.75 an hour, in cash. We estimate that it will take between 3 and 4 hours, depending on how long your group needs to reach agreement on how to solve each of the two problems. An assistant will now take you to your rooms to begin."

b) The Monitor will then procure the appropriate Monitor sequences, checklists, notesheets, questionnaires, and debriefing guide, and follow the Monitor sequence for each problem. The general tasks that the Monitor has to perform for each problem are contained in the appropriate Monitor sequence. General chores are listed in a) to k). The Monitor will have printed out three double-spaced copies of the conference (+space 1 in scratchpad).

APPENDIX H

MONITOR SEQUENCE FOR TRAINING SESSIONS

1. Type &n912np17,18 which will become CC1 and CC2, if not already done so. These are the initial instructions and conclude with "YOUR FIRST PRACTICE" instructing Ss to enter a two line comment.

2. When the first comment has been entered by all Ss, type

&n912np34

which enters as a comment that they are all doing well, and asks them to enter a comment about what confuses them, and tells them to send more comments, with a final comment about being comfortable with the system.

3. When all Ss have responded that they are comfortable, type

&n912np35

which gives them the test.

4. Once the test has been sent, alert the assistants to go into each subject and have S demonstrate answers. Assistants will correct Ss' errors, and review with Ss any problems or difficulties.

5. Ss will then be debriefed and instructed about returning for actual run.

APPENDIX I

CHECKLIST USED BY MONITOR FOR TRAINING SESSIONS

Monitor Checklist

901 901 902 903 904 905 906 907

1. RECEIVED FIRST COMMENT (TIME?)
2. SENT N912NP34 (Y/N?)
3. ADDITIONAL COMMENTS
4. COMMENT THAT S IS COMFORTABLE WITH SYSTEM (TIME?)
5. SENT N912NP35 (TEST) (Y/N?)
6. ALERTED ASSISTANTS TO BEGIN TEST CORRECTION (Y/N?)

APPENDIX J

MONITOR SEQUENCE FOR FACE TO FACE FOREST RANGER PROBLEM

1) Prior to the run, Monitor will make sure recording equipment is set up, insuring that all mikes have batteries.

2) Take Ss to individual rooms when all have arrived, if F to F is the first condition. Give them the instructions n912np89, and case, n912np80,81,82, to read. The subjects are given 10 minutes to read these (give them a few more minutes if necessary) and then assemble them in the experimental room. The Monitor will remind Ss to sit at the microphone which has their assigned number.

3) MONITOR SAYS:

"You may now begin your group discussion. You may have a maximum of one hour to reach a consensus. We will give you a warning at 30 minutes and at 50 minutes."

The Monitor will remind Ss to try to speak into the microphone.

4) Assistant or person in the observation room turns on the recorders (Three recorders - make sure they are in record mode) during the above instruction.

5) If F to F is the first run, Monitor will have assistants dial the terminals in and modify the names as per the numbers assigned. Assistants will leave the terminal ready to accept new items in the appropriate conference.

6) At the end of 30 minutes, the Monitor will announce that there are 30 minutes remaining. While the Monitor is giving the 30 minute warning, an assistant in the observation room will flip over all three tapes and continue the recording on side two.

7) At the end of the discussion the assistants return the subjects to their individual rooms.

a. If the subjects have already done the CC then they are given the questionnaire.

b. If the subjects have not been in the CC condition, then they are given coke and cookies and bathroom break.

8) While Ss are filling out questionnaires or taking break, Monitor will announce into EACH microphone the date, run name, and name and number of the S who used that mike.

APPENDIX K

MONITOR SEQUENCE FOR FACE TO FACE ARCTIC/DESERT PROBLEM

1. Prior to trial run, Monitor will insure that a) Taping equipment has been set up and turned on; b) There are sufficient copies of materials to be used, and c) That batteries have been placed in mikes.
2. Ss are brought to individual rooms, and a note is made of which S occupies which room.
Waiting in the room is a) a copy of the problem [n912np46 for Desert; n912np48,49 for Arctic]; b) the 15 items to be ranked, complete with carbons [n912np47 for Desert; n912np51 for Arctic].
3. Give Ss 5 minutes to complete initial reading and ranking, and have assistants check to see when Ss are finished.
4. When Ss have finished initial ranking, assistants will collect the original and give to each S the begin discussion instructions [n912np52]. Assistants will transcribe Ss' initial rankings from original.
5. Give Ss one minute to read n912np52, then at the same time, bring ALL Ss into B405, the experimental room. The Monitor will remind Ss to sit at the microphone which has their assigned number, and to try to speak into the microphone.
6. Monitor will insure that during step 4, the tape recorders have been started, and will announce into EACH microphone the trial and date.
7. If F to F is the first run, Monitor will have assistants dial the terminals in and modify the names as per the numbers assigned. Assistants will leave the terminal ready to accept new items in the appropriate conference.
8. At the end of 30 minutes, the Monitor will announce that there are 30 minutes remaining. While the Monitor is giving the 30 minute warning, an assistant in the observation room will flip over all 3 tapes and continue the recording on side two.
9. During the final 30 minutes, Monitor will insure that Ss' original rankings have been returned to their respective rooms, along with a copy of the rerank instructions, n912np53.
10. At 60 minutes, the Monitor enters and says [n912np54]:-
"The group discussion time is now over. We will allow you 5 more minutes in which to complete your discussion if you need it. Then an assistant will take each of you back to you individual rooms, where you will receive further instructions."
11. After 5 minutes, Monitor and assistants conduct Ss back to

respective rooms to rerank.

12. While Ss are reranking, Monitor will announce into each microphone the name and # of the S who used it.

13. If Desert/Arctic has been first, then coke and cookie. If second, administer questionnaires and debrief.

APPENDIX L

BEGIN DISCUSSION INSTRUCTIONS FOR FACE TO FACE ARCTIC PROBLEM

All members of the group have now completed their initial ranking.

You may begin your group discussion and attempt to reach consensus on the ranking.

You will have 60 minutes in which to complete discussion and reach consensus. You will receive a warning at the end of 30 minutes.

At the end of the discussion, you will be asked to report the rankings agreed upon by the group.

When your group reaches the point where each person can say, "Well even though it may not be exactly what I want, at least I can live with the decision and support it", then the group has reached consensus. This doesn't mean that all of the group must completely agree, but rather that everyone is in fundamental agreement. Therefore, treat differences of opinion as a way of 1) gathering additional information, 2) clarifying issues, 3) forcing the group to seek better information.

IMPORTANT

If at any time you wish to share your ranking of the items with the other conference participants, you may do so by means of the carbon copy of your rankings that you have retained.

Of course, you can see how any of the others ranked the items only if an individual decides to share his or her ranking with the conference participants.

An assistant will now take you to a conference room where you will begin your discussion.

APPENDIX M

RERANK INSTRUCTIONS FOR FACE TO FACE ARCTIC PROBLEM

We are going to ask you to rerank the items now that you have had the discussion.

1. First, in the column headed "FINAL G RANK" on your original sheet, write in YOUR BEST ESTIMATE OF THE DECISION OF THE GROUP AS A WHOLE about the rank order of the items. Remember, use the ranks from 1 the most important, to 15 the least important, for the relative importance of each item for the survival of your group, ACCORDING TO YOUR PERCEPTION OF WHAT THE GROUP DECIDED.

2. Now, in the column headed "FINAL M RANK" on your original sheet, write in YOUR OWN FINAL DECISION ON THE RANK ORDER OF THE ITEMS. Remember, use the ranks from 1 the most important, to 15 the least important, for the relative importance of each item for the survival of your group, ACCORDING TO WHAT YOU, YOURSELF, REALLY THINK THE PROPER RANKING OF THE ITEMS SHOULD BE, now that you have had the discussion.

APPENDIX N

MONITOR SEQUENCE FOR COMPUTER CONFERENCE ARCTIC PROBLEM WITH REVIEW

1. The Review conferences are 902-905. They should contain the Review instructions n912np68. If not, enter them by typing &n912np68, which are the Review instructions which tell Ss to practice sending comments to each other.
2. After 10 minutes, when Ss seem to be comfortable once again, type &n912np79
which is a comment to end practice, and wait for instructions.
3. Monitor will alert assistants that the practice is over, and send assistants to Ss to make sure that they have stopped activity.
4. While assistants are upstairs insuring that activity is stopped, Monitor will enter the problem for the day, if not already done so. C910 should be pre-loaded with Desert, and c906-909 should be pre-loaded with Arctic.
5. If Arctic has not been pre-loaded, type &n912np70,71,73, which is the Arctic problem, concluding with instructions for S to type + rank artic.
6. When S types +rank artic, the proc. will deliver n912np78, the start ranking instructions, and will present S the list of 15 items to be ranked, n912np77.
7. When S has completed initial ranking, the proc. will deliver n912np74, instructing S to wait until ALL have finished ranking.
8. When ALL Ss have completed initial ranking, the proc. will deliver n912np75, which are the begin discussion instructions, concluding with the instruction on +sharerank.
9. If for some reason all Ss could not complete ranking, Monitor will type +rankdone, which will end the ranking proc. and deliver n912np75.
10. At the end of 90 minutes, Monitor will enter the end discussion instruction, by typing &n912np59
which concludes with instructions to enter one last comment.
11. Monitor will wait for two minutes and send a copy of n912np58, the rerank instructions and the items, by entering &n912np58.
12. When all Ss have completed final ranking, they will either be given questionnaires and then debriefed, if the Arctic problem is second, or coked and cookied if the Arctic problem is first. If the Arctic problem was first, Ss should remain in their rooms during coking (other than for bathroom), and instructed not to talk to each

other. After all have been refreshed, assistants will bring in the material for Bales F t F.

NOTE: IF ANY SUBJECT HAS SEEN ARCTIC, PROCEED AS FOLLOWS

a) Setrank for Desert by typing +SETRANK.

b) When asked Experiment name?, give it a name, like Desert 1, or somesuch.

c) When asked Number of users?, type 5.

d) When asked Starting storage page?, use same pages that would have been used if Arctic were to have been run, or start 10 pages later.

e) When asked Increment?, type +desert.

1. The ranking proc. for Desert has now been set up. Enter the Desert problem by typing

&n912np66

which is the Desert problem, concluding with the instruction for S to type +rank desert. This should only be necessary if for some reason Desert has not been pre-loaded in C910.

2. When S types +rank desert, the proc. will deliver n912np60, the start ranking instructions, and will present the S the list of 15 items to be ranked, n912np61.

3. When S has completed the initial ranking, the proc. will deliver n912np62, instructing S to wait until ALL have finished ranking.

4. When ALL Ss have completed initial ranking, the proc. will deliver n912np63, which are the begin discussion instructions, concluding with the instruction on +sharerank.

5. If not all complete ranking, Monitor will type +rankdone, to end ranking proc. and deliver n912np63.

6. At the end of 90 minutes, Monitor will enter the end discussion instruction, by typing

&n912np59

which concludes with instruction to enter one last comment.

7. Monitor will wait two minutes and send a copy of n912np57, the rerank instructions and the items, by entering &n912np57.

8. When all Ss have completed ranking, continue as per #12 above.

APPENDIX O

REVIEW INSTRUCTIONS FOR PROBLEM RUNS IN COMPUTER CONFERENCE

REVIEW

Please do not type past space 110 before pressing the RETURN key.

Here are the steps for entering a COMMENT into a conference:

a) When the terminal prints

CONFERENCE CHOICE?

type 4, which will put you into your scratchpad.

b) The terminal will tell you that you are in your scratchpad by printing

ENTERING SCRATCHPAD:

1?

Type what you want to say beginning on this first line, and press the RETURN key.

c) Each line you type is numbered. Always wait for the line number with a ? to appear before you begin typing a new line.

d) When you have typed all the lines you wish to send, type

+comment

as the FIRST AND ONLY ENTRY ON THE NEXT NEW LINE, and press the RETURN key.

THE +LOOK command

To see if any comments are waiting for you, you may come out of your scratchpad by typing

+look

as the first and only thing on a new line of the scratchpad. Then press the RETURN key.

This will look and tell you if anything is waiting; after you are finished reading new items, you will be put back in your scratchpad.

Please enter a practice COMMENT to the group, saying something about yourself. Then, spend about ten minutes sending COMMENTS of your own and reading the COMMENTS of the others in order to get re-acquainted with each other. If you have any problems, please ask the assistant.

Then enter +look every minute or so to receive the practice COMMENTS of others and your next instruction.

APPENDIX P

END PRACTICE INSTRUCTION FOR REVIEW IN PROBLEM RUNS IN COMPUTER
CONFERENCE

The practice time is now over. Please do not do anything else
until an assistant comes in to put you into today's problem
conference.

APPENDIX Q

MONITOR CHECKLIST FOR COMPUTER CONFERENCE ARCTIC PROBLEM AND REVIEW

901 901 903 904 905

1. Received first comment (Time?)
2. Additional comments?
3. Sent n912np79 (Time?)
4. Entered problem
(n912np66 for Desert)
(n912np58 for Arctic)?
5. Ranking started (Time?)
6. Ranking completed (Time?)
7. Sent End Discussion (n912np59)
8. Sent Rerank instructions
(n912np57 for Desert)
(n912np58 for Arctic)?
9. Alerted assistants that Reranking started?
10. Distributed Questionnaires
(if Desert/Arctic is second)?

APPENDIX R

MONITOR SEQUENCE FOR COMPUTER CONFERENCE FOREST RANGER PROBLEM WITH REVIEW

MONITOR SEQUENCE FOR REVIEW

1. The Review conferences are 902 through 905. Each has loaded in n912np68, the Review instructions, as ccl. All terminals will have been signed on with the names of the Ss, and entered into the Review conference for the day. The terminal will be left at ACCEPT NEW ITEMS?

2. The Review instructions tell Ss to practise sending comments to each other for 10 minutes. After 10 minutes have elapsed, and Ss seem to be comfortable once again, type

&n912np79

which is a comment to end practice, and wait for instructions.

3. Monitor will alert assistants that the practice is over, and send assistants to put subjects in the problem conference for the day.

MONITOR SEQUENCE FOR BALES CC

1. While assistants are upstairs insuring that activity is stopped, Monitor will enter the problem for the day, if not already done so. Normally, Bales will be pre-loaded in C908 and C909. If not,

2. Type &n912np 88,80,81,82 These are the Bales instructions for CC, and the case in three parts. The instructions tell Ss to begin discussion after having read the case.

3. The Monitor will get printout of the first four comments and then do +gc#,a until subjects have all received the first four items. Then monitor sets timer for 30 minutes.

4. After 30 minutes, the monitor will enter &n912np55, the 30 minute warning.

5. After 50 minutes, type in 50 minute warning (You now have up to 10 minutes remaining time).

6. After 60 minutes, type &n912np56, the end discussion instruction.

7. Assistants will deliver the questionnaires 5 minutes after n912np56 is sent, if Bales CC has been the second run. If Bales CC has been the first, Ss will be coked and cookied, and given a

bathroom break, but otherwise will remain in their rooms awaiting the instructions for Desert/Artic F to F.

8. Monitor will have printed out 3 copies of both the Review conference and the Problem conference (to be double-spaced, by entering +spacel while in scratchpad).

APPENDIX S

THIRTY MINUTE WARNING FOR COMPUTER CONFERENCE FOREST RANGER PROBLEM

You have 30 minutes from the time printed above to reach a group decision.

APPENDIX T

END DISCUSSION INSTRUCTION FOR COMPUTER CONFERENCE FOREST RANGER PROBLEM

The sixty minutes allotted for discussion is now over. You have a five minute "grace period" if you need it to reach a group decision.

APPENDIX U

MONITOR CHECKLIST FOR COMPUTER CONFERENCE FOREST RANGER PROBLEM

- | | 901 | 902 | 903 | 904 | 905 |
|---|-----|-----|-----|-----|-----|
| 1. Received first comment (Time)? | | | | | |
| 2. Additional comments? | | | | | |
| 3. Sent n912np79 (Time)? | | | | | |
| 4. Entered problem (Time)?
(n912np88,80,81,82) | | | | | |
| 5. 30 minute warning sent? | | | | | |
| 6. Sent End Discussion (n912np56)? | | | | | |
| 7. Alerted assistants? | | | | | |
| 8. Distributed questionnaires
(if Bales CC is second)? | | | | | |

APPENDIX V

INSTRUCTIONS GIVEN TO ASSISTANTS FOR SCHEDULING OF SUBJECTS

Instructions for scheduling subjects for a run

If the subjects ask questions, repeat the information on the recruiting form.

1. You will receive 8 (hopefully) subject-candidate forms.
2. Check the list of already used subjects and eliminate any that have been used. Ask for or find a replacement candidate.
3. Call each potential subject, or find him/her in person.

Conversation:

Hello, I am (name) and I am assisting with the experiments which you have volunteered for. I would like to schedule you for a group which will be meeting on (Tuesday afternoons, or whenever).

Could you be present at the two following times:

Training time
Run date and time.

If yes-- Ok, please be sure to be in Beck 206 by (time) on (date).

Here is my telephone number- please call me if you cannot be there. It is very important that we have the exact number of group members present at each scheduled time.

I will try to give you a reminder call on (mention time). Is that a good time to reach you? (time should be night or afternoon before scheduled training).

4. If you do not get 7 agreements, find replacements until 7 have confirmed.

APPENDIX W

TRAINING INSTRUCTIONS FOR COMPUTER CONFERENCE

Hi! Today you are going to learn to use a computer mediated system for human communication. We are going to teach you how to "talk" with the other members of this conference, by typing what you want to say on to this terminal and having it sent to the other conference members. First, we want to show you how easy it is to type on this terminal.

HOW TO TYPE ON THIS COMPUTER TERMINAL

There is room for a certain number of spaces on a line. The spaces are marked on a strip just in front of the print mechanism. You can always look and see how far you have typed on a line. When you press the RETURN key, the carriage will return and give you a new line.

PLEASE DO NOT TYPE PAST SPACE 110 BEFORE PRESSING THE RETURN KEY

To make a blank space, you press the large space bar on the bottom.

The letters on this terminal are just like a typewriter. To type a capital letter or a character in the upper case range, hold down the SHIFT key — you will find one of these on the left and one on the right. The numbers are all on the top row, which is also like a typewriter. However, there are some ways in which typing on this terminal differs from a typewriter.

1. Typing in a "SCRATCHPAD"

When you want to say something to the other conference members, you will be typing what you want to say into what is called a "SCRATCHPAD". These are numbered lines into which you type the text of what you want to say. The terminal will tell you when it is ready for you to start typing what you want to say by printing

ENTERING SCRATCHPAD:

1?

You can now type the first line of what you want to say on this line that begins with a 1? When you are finished typing a line, press the RETURN key. If what you are going to say takes more than one line, pressing the RETURN key will give you a new numbered line on which to type which looks like

2?

When you have typed what you wish on line 2, and need more lines, pressing the RETURN key at the end of every line will give you a new numbered line on which to type. ALWAYS WAIT FOR THE NEW NUMBERED LINE TO APPEAR BEFORE YOU RESUME TYPING. Even if what you have to say takes only one line, always press the RETURN key after you have typed a line. Pressing the RETURN key enters what you have

typed into the computer. Until you press the RETURN key, nothing can be done with the line you have typed.

2. The BACKSPACE key.

Unlike a typewriter, the BACKSPACE key on the upper right serves a special function on this terminal. If you make a mistake on a line, you can correct it by pressing the BACKSPACE key to back up over the error; then you retype from there. It will look like letters typed on top of each other on your terminal, but when it goes to the computer, it will be corrected.

HOW TO SEND WHAT YOU HAVE TYPED TO THE OTHER CONFERENCE MEMBERS

Once you have typed into your scratchpad what you want to say, you can send it to the other members of the conference by typing

+comment

AS THE FIRST AND ONLY THING AT THE BEGINNING OF THE NEXT NEW LINE IN YOUR SCRATCHPAD, and then pressing the RETURN key.

What you have typed will now be sent by the computer to ALL of the other members as a conference COMMENT.

You will automatically be told whenever others have entered COMMENTS that are available for you to choose to read. A conference builds up a common transcript of all of the COMMENTS entered by the members, and each of the COMMENTS entered by you and the other members is given a number.

SOME IMPORTANT THINGS YOU MUST KNOW

1. The system may ask you some questions.

Type y and press the RETURN key for YES.

Type n and press the RETURN key for NO

For example, the system will tell you when there are new COMMENTS that have been entered if you care to read them by asking

ACCEPT NEW ITEMS?

If you type y and press the RETURN key, the terminal will print them out for you; if you type n and press the RETURN key, you won't be given the items, but you will have a chance to get them later.

2. If you want to look at what you have typed, you may roll the paper up. However,

PLEASE DO NOT TRY TO ROLL THE PAPER BACK DOWN

or it may jam. The computer automatically continues on the same line, even though you have moved the paper. You may roll up the paper at anytime you wish, as long as the terminal is not printing. This will not effect what you type.

3. In addition to the other members of this conference, there is a Monitor whose number is 912. The Monitor will occasionally send you instructions asking you to do certain things.

4. If by any chance you get an unexpected question, and think you may be out of this conference by mistake, type

+gc912,n

and press the RETURN key as the answer to that question. That will get you back into this conference.

5. The +LOOK command

To see if any COMMENTS are waiting for you, you may come out of your scratchpad at any time by typing

+look

as the first and only thing on a new line of your scratchpad. Then press the RETURN key. This will look and tell you if anything is waiting. After you are finished reading new items, you will be put back into your scratchpad, right where you were before entering +look. Nothing will be erased.

6. If the terminal prints

CONFERENCE CHOICE?

Type 4 and press the RETURN key. This will put you back into your scratchpad.

7. Do not use a small "L" for the numeral "1". There is a character for the numeral one.

Do not use the letter "o" for the numeral "0". There is a character for the numeral zero on the top line.

YOUR FIRST PRACTICE

PLEASE DO EACH OF THE FOLLOWING WHEN THE TERMINAL STOPS PRINTING

a) The last thing printed by the terminal when it stops printing should be

CONFERENCE CHOICE?

Type 4 and press the RETURN key. This will put you into your scratchpad, ready to type something. The terminal will indicate that you are in your scratchpad by printing

ENTERING SCRATCHPAD:
1?

b) Type anything you wish that is less than one line in length. Then press the RETURN key. The terminal will print

2?

c) Type in any word on this second line, deliberately making a typing error. Now backspace to the error and retype correctly over it. You have now corrected your typing error! Now press the RETURN key. The terminal will print

3?

d) Now type

+comment

as the first and only thing on this third line, and press the RETURN key.

What you have typed in lines one and two has now been sent to all members of the conference as a conference COMMENT. You have now entered your first COMMENT into a computer conference!

Happy conferencing! You CAN do it!

PLEASE TEAR OFF THESE INSTRUCTIONS AND REREAD THEM

APPENDIX X

FIRST MESSAGE SENT TO SUBJECTS IN COMPUTER CONFERENCE TRAINING

You are all doing very well. Now try to enter a comment into the conference describing anything you find confusing so far.

After entering a comment about the things you find confusing, you should try to communicate with the other members of the conference by entering comments of your own. Read and try to answer the comments of the other participants. You should try to get to know one another.

After you have sent and received a number of comments, and feel comfortable with the system, enter a comment saying that you know how to send and receive conference communications.

APPENDIX Y

CRITERION TEST FOR COMPUTER CONFERENCE TRAINING

A TEST

We would like to see how well we have been able to teach you to use this system. Below are four questions. Please show the assistant that you know how to do each of these.

1. How do you enter a conference COMMENT to all the members of the group?
2. How do you look and see if any conference items are waiting for you?
3. How do you make corrections?
4. What do you answer if the system asks CONFERENCE CHOICE?

After you have shown the assistant that you know how to do each of these, we will all meet again in room 206.

APPENDIX Z

THE FOREST RANGER PROBLEM

FOREST RANGER THOMAS EVANS

In December 1974 Forest Ranger Thomas Evans transferred to a district in the eastern part of his state. The new district was relatively small, and in terms of its area, has less equipment and fewer personnel than his former district. The housing for the men was extremely poor, the motor equipment was poor, and the tools inadequate. The Ranger's house, however, was brand new, and the surrounding garden was very attractive. The former ranger had let the district run down, and Evans had been asked to come and build it up.

Above all, Evans was anxious to keep the number of fires down to a minimum, and to make a good showing to his new superintendent, Mr. Clark. On the whole, the number of fires in the district had been quite limited in the last ten years, due to the terrain and the relative inaccessibility of the area. However, Evans knew that his facilities and organization were not in good enough shape to deal adequately with any greatly increased fire threat, if the coming summer should turn out to be exceptionally dry.

In April Evans received an application for summer work from Bill Perkins who had worked for him before in his former district. Perkins was about 25 years old, a second-year forestry student at the State agricultural College, and intended to go into the Forest Service. Prior to his entry in college he had been in the Navy for seven years, and had been wounded in action. He was married, with one child. By the time he got out of the Navy, he had told Evans, he felt he had lost enough time, and was anxious to get ahead with his career. He was required by his college course to have so much experience "in the field". Evans was personally fond of Bill, and wanted to see him get ahead in the Forest Service. He knew Bill was anxious to do a good job, since Evans would send a report about his work to the State College at the end of the summer. The year before, Bill had worked in the office for Evans, as a dispatcher, and Evans felt he was a very rapid learner, and had done a good job. Evans has been particularly pleased since the dispatcher before Bill had been extremely poor. Bill had learned something about the woods from his course work and from his office work with Evans last year, but had not yet done any maintenance in the woods. Evans felt it would be good this year if he could move Bill out of the office and into some actual maintenance work. He decided, in view of the fact that Bill intended to go ahead in the Forest Service and needed the experience, to appoint him as foreman of the maintenance crew. The rank of foreman was equivalent in pay to that of dispatcher, which had been Perkins' former position, so the change of jobs would not involve any demotion for Bill. The crew was small and the job would be simple, consisting mostly in piling brush left by loggers at the side of the forest roads and trails.

One of the other men who wrote early for summer work was Joe Phillips. From his letter of application, Evans learned that Phillips was a fourth-year student at the State University, was 19 years old, and intended to go ahead with graduate work in chemistry, but needed summer work to provide funds. Phillips had worked for the former ranger the past three summers. He worked as a lookout for the first and second year. The third year he worked on a trail maintenance crew and had done some firefighting. When the foreman of the crew quit, toward the end of the summer, he had been the foreman until he returned to school about three weeks later. Evans wrote Phillips that he could use him as a regular worker on the maintenance crew, doing the same kind of work as he had done last year, and that he would be glad to have him come.

Labor, it turned out, was scarce, and Evans had some difficulty in getting further men for the crew. The other three members of the crew were finally recruited from local men who had worked some for the former ranger, but were not highly experienced. One was a deaf boy, named Bob, son of a local minister. He was very strong and willing, but somewhat childish and dependent. Another was Art, a small but wiry and reliable man of about forty, who had been a farm hand most of his life. Finally there was Frank, a mill hand and general laborer, who was the brother-in-law of the former ranger.

As Evans feared, the summer turned out to be dry, and there were several small fires early in the summer. When there was a fire, the maintenance crew turned to fire fighting. Evans was on the job, and none of these small fires proved to be serious enough to call in crews from other districts. About three weeks after a bad thunder storm, however, a sleeping fire which had been started by lightning suddenly flared up. The fire was up about 7500 feet in some alpine fir, and extremely hard to get to. About thirty men were called in, and after the fire had been fairly well subdued all the men except Bill and his crew left. That night the fire got away again, and the men were called back. This time Mr. Clark, Superintendent of the Forest, came in to see what the trouble was. This was quite embarrassing for Evans especially since he was trying to keep a good fire record, and since in the Forest Service it is a disgrace to have a fire "blow up" on you. Evans maintained to Mr. Clark that "there was just too much fire to control", but wondered whether the inexperience of his men, especially Bill, who was in charge of the crew had anything to do with it.

When Evans talked to Bill, Bill admitted of course that he was not experienced in fire control, but didn't think this was really to blame for the fact that the fire got away again. He said that a certain amount of time was lost at one point when Joe "took off on his own" and went to work to stop the fire at another place. Bob went along with Joe, and Bill had to go after them to get them back on the job with him and the other men. He said there had been some difficulty with Joe ever since they started work. Sometimes Joe would be talking to the other men and they would stop talking when he (Bill) came up. Bill said it seemed to him that the crew had been having an awful lot of trouble with equipment, also. Of course the equipment was old, but handles of things got broken, things got

misplaced, and all sorts of little things seemed to keep going wrong. It seemed like it was always difficult to get coordinated and get going on a job. Joe was a good man, and did what he was told, but seemed to have some kind of chip on his shoulder. Bill said he had tried kidding him along about one thing and another, but it didn't seem to do much good.

That night Joe came to see Evans and said he wanted to quit unless something was done. He said he felt it was unfair that he should have to work as an unskilled worker on a job where he had been foreman the year before, and then under a man who knew little about the job. He stressed especially the fact that he needed the money badly, and that the difference between the pay of an unskilled worker and that of foreman was important to him. He brought out the fact that actually he more or less ran the crew, and that the men seemed to look to him rather than to Bill as their leader. He said he had taught Bob all he knew about the work last year, and that Superintendent Clark had been pleased that he sort of helped Bob out. When Evans asked him why he thought the fire had gotten away, Joe said that he and the other men thought that if Bill had taken his advice and had put the crew to work on the natural break he and Bob had started to clear, the fire wouldn't have gotten away again. However, Joe said, this was a matter of judgment. The wind had come up suddenly and there was a good deal of fire to hold. If he had been running the crew, he would have not tried to stop the fire where Bill did, but would have tried to stop it ahead at the natural break.

Evans brought out the fact that Bill was an older man than Joe, was a veteran, and also a forestry student who intended to go ahead in the service. He was a kind of investment for the service, and the service would have a good man in Bill later, whereas Joe was only interested in summer work. Joe said he could see a certain amount of sense in that, but just the same he wasn't willing to go ahead working with things organized as they were now. Evans told Joe that he wished he would stay for a day or two until things were under control again, and he had a chance to think things over. Joe said he would stay "till the fire was out, anyway". The interview ended on that indefinite note.

After the interview Evans thought over all the facts of the situation, and felt that he was in a spot regarding his crew for the rest of the summer. He wondered what would be the best thing for him to do.

APPENDIX AA

INSTRUCTIONS SUBJECTS RECEIVE FOR FACE TO FACE FOREST RANGER PROBLEM

INSTRUCTIONS FOR THE GROUP DISCUSSION

BACKGROUND: You will be asked to discuss a problem of human relations. The case you will consider has been written up from an actual life situation. The names have been disguised, but otherwise very few changes have been made. The case concerns a person facing a problem in their organization. Assume that you as a group are members of the staff. You have been asked to have a meeting to consider the problem and advise on the following two questions:

- a) Why are the persons involved behaving as they do?
- b) What should be done about it?

Before you start the discussion, each of you will read a summary of the facts about the situation. No attempt has been made to decide whether the facts in your summary are relevant and important or not. The aim is to give you a general factual background of the sort you might have as an individual staff member before the meeting starts. After you have read the summary you will immediately start your group discussion. The following three points deal with questions that may occur to you.

1. Generally in discussions people come with factual backgrounds which are the result of their own particular experience. A given person can never be sure that the range of facts he has from his experience is exactly the same as the range of facts known to other participants. This is true of this discussion. Each of you will be given an accurate factual summary of the case.

2. In most discussions where decisions are to be made, the amount of information available is limited. That is true of this discussion. Your summaries include all the known facts about the case, but other facts which might be relevant are still unknown. You will have to make your plan on the basis of whatever you can infer or reconstruct about the situation from the limited information available.

3. This group is not supposed to decide merely to shift the responsibility for making a definite plan on to somebody else.

You are expected to arrive at the best concrete and realistic plan of action you can in this matter, by discussion and group decision. The recommendation which best represents the agreement of the group as a whole should be summarized when you have reached a decision.

Observation: Your comments will be observed and recorded for later analysis. The identities of all individuals will be kept confidential in any research reports. You will be identified only by

your number.

TIME

You will be asked to take up to one hour for discussion, after reading the case history. You will occasionally be reminded of the time remaining.

We are allowing approximately seven minutes for you to read the case.

APPENDIX BB

INSTRUCTIONS SUBJECTS RECEIVE FOR COMPUTER CONFERENCE FOREST RANGER PROBLEM

The practice period is now over.

INSTRUCTIONS FOR THE GROUP DISCUSSION

BACKGROUND: You will be asked to discuss a problem of human relations. The case you will consider has been written up from an actual life situation. The names have been disguised, but otherwise very few changes have been made. The case concerns a person facing a problem in their organization. Assume that you as a group are members of the staff. You have been asked to have a meeting to consider the problem and advise on the following two questions:

- a) Why are the persons involved behaving as they do?
- b) What should be done about it?

Before you start the discussion, each of you will read a summary of the facts about the situation. No attempt has been made to decide whether the facts in your summary are relevant and important or not. The aim is to give you a general factual background of the sort you might have as an individual staff member before the meeting starts. After you have read the summary you will immediately start your group discussion. The following three points deal with questions that may occur to you.

1. Generally in discussions people come with factual backgrounds which are the result of their own particular experience. A given person can never be sure that the range of facts he has from his experience is exactly the same as the range of facts known to other participants. This is true of this discussion. Each of you will be given an accurate factual summary of the case.

2. In most discussions where decisions are to be made, the amount of information available is limited. That is true of this discussion. Your summaries include all the known facts about the case, but other facts which might be relevant are still unknown. You will have to make your plan on the basis of whatever you can infer or reconstruct about the situation from the limited information available.

3. This group is not supposed to decide merely to shift the responsibility for making a definite plan on to somebody else. You are expected to arrive at the best concrete and realistic plan of action you can in this matter, by discussion and group decision. The recommendation which best represents the agreement of the group as a whole should be summarized when you have reached a decision.

Observation: Your comments will be observed and recorded for later analysis. The identities of all individuals will be kept confidential in any research reports. You will be identified only by your number.

TIME

You will be asked to take up to one hour for discussion, after reading the case history. You will be given a time reminder at the end of 30 and 50 minutes.

We are allowing approximately seven minutes for you to read the case.

You may begin your group discussion when you have finished reading the case. Remember that to enter a COMMENT to the group, type +comment as the only entry on a new line of the scratchpad, and press the RETURN key.

APPENDIX CC

INSTRUCTIONS SUBJECTS RECEIVE FOR FACE TO FACE ARCTIC PROBLEM

All members of the group have now completed their initial ranking.

You may begin your group discussion and attempt to reach consensus on the ranking.

You will have 60 minutes in which to complete discussion and reach consensus. You will receive a warning at the end of 30 minutes.

At the end of the discussion, you will be asked to report the rankings agreed upon by the group.

When your group reaches the point where each person can say, "Well even though it may not be exactly what I want, at least I can live with the decision and support it", then the group has reached consensus. This doesn't mean that all of the group must completely agree, but rather that everyone is in fundamental agreement. Therefore, treat differences of opinion as a way of 1) gathering additional information, 2) clarifying issues, 3) forcing the group to seek better information.

IMPORTANT

If at any time you wish to share your ranking of the items with the other conference participants, you may do so by means of the carbon copy of your rankings that you have retained.

Of course, you can see how any of the others ranked the items only if an individual decides to share his or her ranking with the conference participants.

An assistant will now take you to a conference room where you will begin your discussion.

APPENDIX DD

END DISCUSSION INSTRUCTIONS SUBJECTS RECEIVE FOR FACE TO FACE ARCTIC PROBLEM

"The group discussion time is now over. We will allow you 5 more minutes in which to complete your discussion if you need it. Then an assistant will take each of you back to your individual rooms, where you will receive further instructions."

APPENDIX EE

RERANK INSTRUCTIONS SUBJECTS RECEIVE FOR FACE TO FACE ARCTIC PROBLEM

We are going to ask you to rerank the items now that you have had the discussion.

1. First, in the column headed "FINAL G RANK" on your original sheet, write in YOUR BEST ESTIMATE OF THE DECISION OF THE GROUP AS A WHOLE about the rank order of the items. Remember, use the ranks from 1 the most important, to 15 the least important, for the relative importance of each item for the survival of your group, ACCORDING TO YOUR PERCEPTION OF WHAT THE GROUP DECIDED.

2. Now, in the column headed "FINAL M RANK" on your original sheet, write in YOUR OWN FINAL DECISION ON THE RANK ORDER OF THE ITEMS. Remember, use the ranks from 1 the most important, to 15 the least important, for the relative importance of each item for the survival of your group, ACCORDING TO WHAT YOU, YOURSELF, REALLY THINK THE PROPER RANKING OF THE ITEMS SHOULD BE, now that you have had the discussion.

APPENDIX FF

RANKING INSTRUCTIONS SUBJECTS RECEIVE FOR COMPUTER CONFERENCE ARCTIC PROBLEM

The name of each of the items on the list will now be given to you, one at a time. Then you will be asked, "Rank?". Please type a number between 1 and 15 as your rank for the relative importance of each item for the survival of your group.

Your rank will be entered for each item when you press the RETURN key.

APPENDIX GG

WAIT INSTRUCTION FOLLOWING RANKING FOR COMPUTER CONFERENCE ARCTIC PROBLEM

Thank you. When all of the members of the group have completed their initial ranking, you will be told that you may begin discussion.

APPENDIX HH

BEGIN DISCUSSION INSTRUCTIONS FOR COMPUTER CONFERENCE ARCTIC PROBLEM

All members of the group have now completed their initial ranking.

You may begin your group discussion and attempt to reach consensus on the ranking. Remember that to enter a COMMENT to the group, type +comment as the only entry on a new line of the scratchpad, and press the RETURN key.

You will have 90 minutes in which to complete discussion and reach consensus. You will receive a warning at the end of 45 minutes.

At the end of the discussion, you will be asked to report the rankings agreed upon by the group.

When your group reaches the point where each person can say, "Well even though it may not be exactly what I want, at least I can live with the decision and support it", then the group has reached consensus. This doesn't mean that all of the group must completely agree, but rather that everyone is in fundamental agreement. Therefore, treat differences of opinion as a way of 1) gathering additional information, 2) clarifying issues, 3) forcing the group to seek better information.

IMPORTANT

If at any time you wish to share your ranking of the items with the other conference participants, type +sharerank as the only entry on the first line of your scratchpad, and press the RETURN key.

After you have typed +sharerank and pressed the return key, the terminal will print l4: and pause. Then it will automatically enter your ranks as a conference COMMENT.

Of course, you can see how any of the others ranked the items only if an individual decides to enter his or her ranking into the conference.

APPENDIX II

END DISCUSSION INSTRUCTIONS FOR COMPUTER CONFERENCE ARCTIC PROBLEM

The discussion time is now over. Please enter one final COMMENT, even if it is only " I have nothing more to say". Then wait a minute and enter +look to receive the final COMMENTS of the others, and your next instructions.

APPENDIX JJ

RERANK INSTRUCTIONS FOR COMPUTER CONFERENCE ARCTIC PROBLEM

We are going to ask you to rerank the items now that you have had the discussion.

1. First, in the column headed "FINAL G RANK" on the following list, write in YOUR BEST ESTIMATE OF THE DECISION OF THE GROUP AS A WHOLE about the rank order of the items. Remember, use the ranks from 1 the most important, to 15 the least important, for the relative importance of each item for the survival of your group, ACCORDING TO YOUR PERCEPTION OF WHAT THE GROUP DECIDED.

2. Now, in the column headed "FINAL M RANK" on the list, write in YOUR OWN FINAL DECISION ON THE RANK ORDER OF THE ITEMS. Remember, use the ranks from 1 the most important, to 15 the least important, for the relative importance of each item for the survival of your group, ACCORDING TO WHAT YOU, YOURSELF, REALLY THINK THE PROPER RANKING OF THE ITEMS SHOULD BE, now that you have had the discussion.

APPENDIX KK

THE ARCTIC PROBLEM

Due to copyright requirements, we cannot reproduce the actual problem, nor the 15 items that were to be ranked. The problem consisted of a survival situation, with 15 items that Ss were to rank in order of their importance for survival.

The Desert problem which was used as a back-up involved a similar survival situation, with 15 items to be ranked for their survival value.

APPENDIX LL

QUESTIONNAIRE FOR GROUP DISCUSSION PARTICIPANTS

NAME _____

DATE _____

Problem: _____

Mode: _____

Please answer all of the following questions as honestly and carefully as you can.

The first five questions ask you to give the name or number of specific group members.

1. Who participated the most? _____
2. Who had the best ideas? _____
3. Who did the most to effectively guide the discussion? _____
4. Who acted most like the group leader? _____
5. Who was the most likeable group member? _____

The next questions relate to the problem, and should be answered on the basis of your reactions as you read through it. These questions contain a number of rating scales on which you are to indicate your impressions of the problem.

6. The problem was:

: 1 : 2 : 3 : 4 : 5 : 6 : 7 :
Completely Neutral Completely
Interesting Boring

7. The situation struck me as:

: 1 : 2 : 3 : 4 : 5 : 6 : 7 :
Realistic Unrealistic

8. The issues involved were:

: 1 : 2 : 3 : 4 : 5 : 6 : 7 :
Completely Completely
Clear Unclear

APPENDIX; ANALYSES OF VARIANCE - BALES CATEGORIES BY MODE AND PROBLEM

2x2x4 Nested Factorial

Arctic

Individual % Data

Bales Category 1 - Shows Solidarity

Means

Mode of Communication

Order of Problem		Mode of Communication		
		FTF	CC	
Order of Problem	1st	1.6893	2.4348	2.0620
	2nd	1.6228	2.4437	2.0333
		1.6561	2.4392	

Nested Design

Source	SS	df	MS	F
A	12.2673	1	12.2673	3.9004
B	.0166	1	.0166	.0053
A X B	.0285	1	.0285	.0091
C/AB	37.7414	12	3.1451	1.3745
S/ABC	146.4430	64	2.2881	
Tot.	196.4967	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	12.2673	1	12.2673	5.0618*
B	.0166	1	.0166	.0068
A x B	.0285	1	.0285	.0117
WG	184.1844	76	2.4234	
Tot.	196.4967	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 1064.5* <.05
 * Significant

A = mode

B = order

C/AB = error term for A B, and A x B

S/ABC = error term for C/AB

WG = Pooled error term

The pooled design yields a significant difference between the FTF and CC conditions. The CC conditions show a greater percent of their comments in the category of shows solidarity.

2x2x4 Nested Factorial

Arctic

Individual % Data

Bales Category 2 - Shows Tension Release

Means

Mode of Communication

Order of Problem		Mode of Communication		
		FTF	CC	
Order of Problem	1st	6.3386	1.4824	3.9105
	2nd	9.0600	1.7114	5.3861
		7.6997	1.5969	

Nested Design

Source	SS	df	MS	F
A	744.8956	1	744.8956	32.7626*
B	43.5509	1	43.5509	1.9155
A x B	31.0827	1	31.0827	1.3671
C/AB	272.8336	12	22.7361	1.6272
S/ABC	894.2696	64	13.9729	
Tot.	1,986.6324	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 *significant

Pooled ANOV

The following pooled design is not really necessary since one finds the variables significant as above.

Source	SS	df	MS	F
A	744.8956	1	744.8956	48.5065*
B	43.5509	1	43.5509	2.8360
A x B	31.0827	1	31.0827	2.0241
WG	1167.1032	76	15.3566	
Tot.	1,986.6324	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 158.5* <.05
 *significant

A = mode
 B = order
 C/AB = error term for A, B, and A x B
 S/ABC = error term for C/AB
 WG = pooled error term

The nested design yields a significant difference between the FTF and CC conditions. The FTF conditions show a greater percent of their comments in category 2 - Shows Tension Release.

2x2x4 Nested Factorial

Arctic

Individual % Data

Bales Category 3 - Agrees

Means

Mode of Communication

Order of Problem		Mode of Communication		
		FTF	CC	
Order of Problem	1st	14.2769	6.3342	10.3055
	2nd	12.4205	7.3116	9.8660
		13.3487	6.8229	

Nested Design

Source	SS	df	MS	F
A	851.7435	1	851.7435	10.5374*
B	3.8632	1	3.8632	.0478
A x B	40.1521	1	40.1521	.4967
C/AB	969.9672	12	80.8305	4.0248*
S/ABC	1285.3352	64	20.0833	
Tot.	3151.0611	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 M.W.U. = 317.5* <.05
 * Significant

Cannot pool - Group and mode significant

A = mode
 B = order
 C/AB = error term for A,B, and A x B
 S/ABC = error term for C/AB

The nested design yields a significant difference between the FTF and CC conditions. The FTF conditions show a greater percent of their comments in category 3 - Agrees.

2.2x4 Nested Factorial

Arctic

Individual % Data

Bales Category 4 - Gives Suggestion

Means

Mode of Communication

Order of Problem		Means		
		FTF	CC	
1st		2.9541	6.1654	4.5597
	2nd	4.1738	3.6118	3.8928
		3.5639	4.8886	

Nested Design

Source	SS	df	MS	F
A	35.1244	1	35.1244	2.6664
B	8.8811	1	8.8811	.6742
A x B	71.1494	1	71.1494	5.4011*
C/AB	158.0782	12	13.1731	1.1749
S/ABC	717.5666	64	11.2119	
Tot.	990.7997	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 * significant

Pooled ANOV

The following pooled design is not really necessary since one finds the variables significant as above.

Source	SS	DF	MS	F
A	35.1244	1	35.1244	3.0486
B	8.8811	1	8.8811	.7708
A x B	71.1494	1	71.1494	6.1753*
WG	875.6448	76	11.5216	
Tot.	990.7997	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 954 >.05
 * significant

A = mode
 B = order
 C/AB = error term for A, B, and A & B
 S/ABC = Error term for C/AB
 WG = Pooled error term

2x2x4 Nested Factorial

Arctic

Individual % Data

Bales Category 5 - Gives Opinion

Means

Mode of Communication

		FTF	CC	
Order of Problem	1st	44.7575	57.4536	51.1055
	2nd	41.2266	58.1476	49.6871
		42.9920	57.8006	

Nested Design

Source	SS:	df	MS	F
A	4385.8779	1	4385.8779	15.6612*
B	40.2414	1	40.2414	.1437
A x B	89.2468	1	89.2468	.3187
C/AB	3360.5725	12	280.0477	2.0813*
S/ABC	8611.6442	64	134.5569	
Tot.	16,487.5829	79		

Table Value for F
 1 and 12 df = 4.75
 12 and 64 df = 1.98
 M.W.U. = 1280* <.05
 * significant

Cannot pool - Mode and Group significant

A = mode
 B = order
 C/AB = error term for A, B and A x B
 S/ABC = error term for C/AB

The nested design yields a significant difference between the FTF and CC conditions. The CC conditions show a greater percent of their comments in category 5 - Gives Opinion.

2x2x4 Nested Factorial

Arctic

Individual % Data

Bales Category 6 - Gives Orientation

Means

Mode of Communication

Order of Problem		Mode of Communication		
		FTF	CC	
Order of Problem	1st	13.6763	12.7484	13.2124
	2nd	15.4825	10.8845	13.1835
		14.5794	11.8165	

Nested Design

Source	SS	df	MS	F
A	149.9274	1	149.9274	1.7651
B	.0003	1	.0003	.0000
A x B	65.5256	1	65.5256	.7715
C/AB	1019.2524	12	84.9376	2.3033*
S/ABC	2360.0502	64	36.8757	
Tot.	3594.7559	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 M.W.U. = 576.5* <.05
 * significant

Cannot Pool - Group significant

A = mode
 B = order
 C/AB = error term for A,B, A x B
 S/ABC = error term for C/AB

2x2x4 Nested Factorial

Arctic

Individual & Data

Bales Category 7 - Asks for Orientation

Means

Mode of Communication

Order of Problem		Mode of Communication		
		FTF	CC	
Order of Problem	1st	3.1346	1.6167	2.3756
	2nd	4.3079	1.6244	2.9661
		3.7212	1.6205	

Nested Design

Source	SS	df	MS	F
A	88.2567	1	88.2567	9.0913*
B	6.9744	1	6.9744	.7184
A x B	6.7925	1	.7925	.6997
C/AB	116.4938	12	9.7078	1.8444
S/ABC	3336.8624	64	5.2634	
Tot.	555.3798	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 * significant

Pooled ANOV

The following pooled design is not really necessary since one finds the variables significant as above.

Source	SS	df	MS	F
A	88.2567	1	88.2567	14.7952*
B	6.9744	1	6.9744	1.1692
A x B	6.7925	1	6.7925	1.1387
WG	453.3561	76	5.9652	
Tot.	555.3798	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 359.5* <.05
 * Significant

A = mode
 B = order
 C/AB = error term for A, B, and A x B
 S/ABC = error term for C/AB
 WG = Pooled error term

The nested design yields a significant difference between the FTF and CC conditions. The FTF conditions show a greater percent of their comments in category 7 - Asks for Orientation.

2x2x4 Nested Factorial

Arctic

Individual % Data

Bales Category 8 - Asks for Opinion

Means

Mode of Communication

		FTF	CC	
Order of Problem	1st	5.4176	8.1955	6.8065
	2nd	4.8850	6.7294	5.8072
		5.1513	7.4624	

Nested Design

Source	SS	df	MS	F
A	106.8283	1	106.8283	2.6991
B	19.9740	1	19.9740	.5047
A x B	4.3580	1	4.3580	.1101
C/AB	474.9512	12	39.5792	2.7151*
S/ABC	932.9704	64	14.5776	
Tot.	1539.0819	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 M.W.U. = 1016* <.05
 * Significant

Cannot Pool - Group significant

A = mode
 B = order
 C/AB = error term for A,B, A x B
 S/ABC = error term for C/AB

2x2x4 Nested &actorial

Arctic

Individual % Data

Bales Category 9 - Asks for Suggestion

Means

Mode of Communication

		Means		
		FTF	CC	
Order of Problem	1st	1.1767	.4926	.8346
	2nd	1.1002	.6704	.8853
		1.1385	.5815	

Nested Design

Source	SS	df	MS	F
A	6.2050	1	6.2050	1.4177
B	.0513	1	.0513	.0117
A x B	.3233	1	.3233	.0739
C/AB	52.5230	12	4.3769	4.1388*
S/ABC	67.6818	64	1.0575	
Tot.	126.7845	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.98
 M.W.U. = 608 >.05
 * Significant

Cannot Pool - Group significant

A = mode
 B = order
 C/AB = error term for A, B, and A X B
 S/ABC = error term for A/AB

2x2x4 Nested Factorial

Arctic

Individual % Data

Bales Category 10 - Disagrees

Means

Mode of Communication

		FTF	CC	
Order of Problem	1st	4.1842	1.7562	2.9702
	2nd	2.8422	3.1655	3.0039
		3.5132	2.4609	

Nested Design

Source	SS	df	MS	F
A	22.1488	1	22.1488	1.2114
B	.0226	1	.0226	.0012
A x B	37.8483	1	37.8483	2.0701
C/AB	219.3969	12	18.2830	3.9994*
S/ABC	292.5710	64	4.5714	
Tot.	571.9876	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.98
 M.W.U. = 615.5 > .05
 * Significant

Cannot Pool - Group significant

A = mode
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for S/AB

2x2x4 Nested Factorial

Arctic

Individual & Data

Bales Category 11 - Shows Tension

Means

Mode of Communication

		FTF	CC	
Order of Problem	1st	1.6223	.5850	1.1036
	2nd	1.4234	.7025	1.0629
		1.5228	.6437	

Nested Design

Source	SS	df	MS	F
A	15.4572	1	15.4572	6.6956*
B	.0331	1	.0331	.0143
A x B	.5004	1	.5004	.2168
C/AB	27.7026	12	2.2085	1.6486
S/ABC	89.6294	64	1.4004	
Tot.	133.3227	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 * Significant

Pooled ANOV

The following pooled design is not really necessary since one finds the variables significant as above.

Source	SS	DF	MS	F
A	15.4572	1	15.4572	10.0122*
B	.0331	1	.0331	.0214
A x B	.5004	1	.5004	.3241
WG	117.3320	76	1.5438	
Tot.	133.3227	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 534.5* <.05
 * Significant

A = mode
 B = order
 A/AB = error term for A, B, A X B
 S/ABC = error term for C/AB
 WG = pooled error term

The nested design yields a significant difference between the FTF and CC conditions. The FTF conditions show a greater percent of their comments in category 11 - Shows Tension.

Nested Factorial
 Arctic
 Individual & Data
 Bales Category 12 - Shows Antagonism

Means

Mode of Communication

Order of Problem		Mode of Communication		
		FTF	CC	
1st		.7723	.7349	.7536
	2nd	1.4538	2.9971	2.2252
		1.1131	1.8660	

Nested Design

Source	SS	df	MS	F
A	11.3379	1	11.3379	1.2671
B	43.3254	1	43.3254	4.8418*
A x B	12.4923	1	12.4923	1.3961
C/AB	107.3781	12	8.9481	1.9298*
S/ABC	296.7638	64	4.6369	
Tot.	471	2974	79	

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 M.W.U. = 821 >.05
 * Significant

Cannot Pool - Group and Order significant

A = mode
 B = order
 C/AB = error term for A, B, AxB
 S/ABC = error term for AAB

2x2x4 Nested Factorial

Forest Ranger

Individual & Data

Bales Category 1 - Shows Solidarity

Means

Mode of Communication

		FTF	CC	
Order of Problem	1st	.9850	2.7894	1.8872
	2nd	.5850	3.6413	2.1131
		.7850	3.2153	

Nested Design

Source	SS	df	MS	F
A	118.1272	1	118.1272	13.9203*
B	1.0211	1	1.0211	.1203
A x B	7.8363	1	7.8363	.9234
C/AB	101.8314	12	8.4859	3.1134*
S/ABC	174.4582	64	2.7259	
Tot.	403.2741	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 M.W.U. = 1309.5* <.05
 * Significant

Cannot pool - Mode and Group significant

A = mode
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB

The nested design yields a significant difference between the FTF and CC conditions. The CC conditions show a greater percent of their comments in category 1 - Shows Solidarity.

2x2x4 Nested Factorial

Forest Ranger

Individual % Data

Bales Category 2 - Shows Tension Release

Means

Mode of Communication

		FTF	CC	
Order of Problem	1st	4.5299	.7550	2.6424
	2nd	3.4267	.9147	2.1707
		3.9783	.8348	

Nested Design

Source	SS	df	MS	F
A	197.6287	1	197.6287	25.7620*
B	4.4505	1	4.4505	.5801
A & B	7.9740	1	7.9740	1.0394
C/AB	92.05559	12	7.6713	.9186
S/ABC	534.4467	64	8.3507	
Tot.	836.5557	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 * significant

Pooled ANOV

The following pooled design is not really necessary since one finds the variables significant as above.

Source	SS	df	MS	F
A	197.6287	1	197.6287	23.9740*
B	4.4505	1	4.4505	.5399
A x B	7.9740	1	7.9740	.9673
WG	626.5025	76	8.2434	
Tot.	836.5557	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 216* <.05
 * Significant

A = mode
 B = order
 C/AB = error term for A,B, A x B
 S/ABC = error term for C/AB

The nested design yields a significant difference between the FTF and CC conditions. The FTF conditions show a greater percent of their comments in category 2 - Shows Tension Release.

2x2x4 Nested Factorial

Forest Ranger

Individual % Data

Bales Category 3 - Agrees

Means

Mode of Communication

		FTF	CC	
Order of Problem	1st	14.1900	5.4645	9.8273
	2nd	12.1921	4.1183	8.1552
		13.1910	4.7914	

Nested Design

Source	SS	df	MS	F
A	1411.0740	1	1411.0740	32.8693*
B	55.9134	1	55.9134	1.3024
A x B	2.1232	1	2.1232	.0495
C/ABC	515.1580	12	42.9298	.6774
S/ABC	4056.1449	64	63.3772	
Tot.	6040.4135	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 * Significant

Pooled ANOV

The following pooled design is not really necessary since one finds the variables significant as above.

Source	SS	df	Ms	F
A	1411.0740	1	1411.0740	23.4598*
B	55.9134	1	55.9134	.9296
A x B	2.1232	1	2.1232	.0353
WG	4571.3029	76	60.1487	
Tot.	6040.4135	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 256.5* <.05
 * Significant

A = mode
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB
 WG = Pooled error term

The nested design yields a significant difference between the FTF and CC Conditions. The FTF conditions show a greater percent of their comments in category 3 - Agrees.

2x2x4 Nested Factorial

Forest Ranger

Individual % Data

Bales Category 4 - Gives Suggestion

Means

Mode of Communication

Order of Problem		Mode of Communication		
		FTF	CC	
Order of Problem	1st	6.7476	9.3699	8.0587
	2nd	2.6623	9.0513	5.8568
		4.7049	9.2106	

Nested Design

Source	SS	df	MS	F
A	406.0266	1	406.0266	3.7382
B	96.9717	1	96.9717	.8928
A x B	70.9401	1	70.9401	.6531
C/AB	1303.3758	12	108.6146	.7216
S/ABC	9633.6479	64	150.5257	
Tot.	11510.9622	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	406.0266	1	406.0266	2.8214
B	96.9717	1	96.9717	.6738
A x B	70.9401	1	70.9401	.4930
WG	10937.0236	76	143.9082	
Tot.	143.9082	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 1088 >.05
 Not significant

2.2x4 Nested Factorial

Forest Ranger

Individual % Data

Bales Category 5 - Gives Opinion

Means

Mode of Communication

		FTF	CC	
Order of Problem	1st	51.2751	50.6364	50.9557
	2nd	54.2119	53.9285	54.0702
		52.7435	52.2824	

Nested Design

Source	SS	df	MS	F
A	4.2518	1	4.2518	.0203
B	193.9991	1	193.9991	.9279
A x B	.6310	1	.6310	.0030
C/AB	2508.8878	12	209.0739	1.0620
S/ABC	12599.9909	64	196.8748	
Tot.	15307.7606	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	4.2518	1	4.2518	.0214
B	193.9991	1	193.9991	.9758
A x B	.6310	1	.6310	.0032
WG	15108.8787	76	198.8010	
Tot.	15307.7606	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 800 >.05
 Not significant

A = mode
 B = order
 C/AB = error term for A,B, A x B
 S/ABC = error term for C/AB
 WG = pooled error term

2x2x4 Nested Factorial

Forest Ranger

Individual & Data

Bales Category 6 - Gives Orientation

Means

Mode of Communication

		FTF	CC	
Order of Problem	1st	12.6934	17.3087	15.0010
	2nd	12.9207	14.8975	13.9091
		12.8070	16.1031	

Nested Design

Source	SS:	df	MS	F
A	217.2789	1	217.2789	4.1281
B	23.8471	1	23.8471	.4531
A x B	34.8084	1	34.8084	.6613
C/AB	631.6140	12	52.6345	1.5013
S/ABC	2243.8397	64	35.0599	
Tot.	3151.3882	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	217.2789	1	217.2789	5.7428*
B	23.8471	1	23.8471	.6303
A x B	34.8084	1	34.8084	.9200
WG	2875.4337	76	37.8349	
Tot.	3151.3882	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 1051.5* <.05
 * Significant

A = mode
 B =order
 C/AB =error term for A,B, and A X B
 S/ABC = error term for C/AB
 WG = pooled error term

The pooled design yields a significant difference between the FTF and CC conditions. The CC conditions show a greater percent of their comments in category 6 - Gives Orientation.

2x2x4 Nested Factorial

Forest Ranger

Individual % Data

Bales Category 7 - Asks for Orientation

Means

Mode of Communication

		FTF	CC	
Order of Problem	1st	2.8369	1.4789	2.1579
	2nd	3.6967	1.6907	2.6937
		3.2668	1.5848	

Nested Design

Source	SS	df	MS	F
A	56.5808	1	56.5808	5.8366*
B	5.7422	1	5.7422	.5923
A x B	2.0992	1	2.0992	.2165
C/AB	116.3306	12	9.6942	1.9823*
S/ABC	312.9869	64	4.8904	
Tot.	493.7396	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 M.W.U. = 471.5* <.05
 * Significant

Cannot pool - Mode and Group significant

A = mode
 B = order
 C/AB = error term for A,B. A x B
 S/ABC = error term for C/AB

The nested design yields a significant difference between the FTF and CC conditions. The FTF conditions show a greater percent of their comments in category 7 - Asks for Orientation.

2x2x4 Nested Factorial

Forest Ranger

Individual % Data

Bales Category 8 - Asks for Opinion

Means

Mode of Communication

Order of Problem		Mode of Communication		
		FTF	CC	
1st		2.7458	6.1273	4.4366
	2nd	3.0070	4.5842	3.7956
		2.8764	5.3557	

Nested Design

Source	SS	df	MS	F
A	122.9435	1	122.9435	10.2519*
B	8.2176	1	8.2176	.6852
A x B	16.2775	1	16.2775	1.3573
C/AB	143.9066	12	11.9922	.6525
S/ABC	1176.2562	64	18.3790	
Tot.	1467.6014	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 *Significant

Pooled ANOV

The following pooled design is not really necessary since one finds the variables significant as above.

Source	SS	df	MS	F
A	122.9435	1	122.9435	7.0777*
B	8.2176	1	8.2176	.4731
A x B	16.2775	1	16.2775	.9371
WG	1320.1627	76	17.3705	
Tot.	1467.6014	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 1059.5* <.05
 * Significant

A = mode
 B = order
 C/AB = error term for A,B, A x B
 S/ABC = error term for C/AB
 WG = Pooled error term

The nested design yields a significant difference between the FTF and CC conditions. The CC conditions show a greater percent of their comments in category 8 - Asks for Opinion.

2x2x4 Nested Factorial

Forest Ranger

Individual % Data

Bales Category 9 - Asks for Suggestion

Means

Mode of Communication

		FTF	CC	
Order of Problem	1st	.2520	.4847	.3683
	2nd	.3495	.7616	.5555
		.3007	.6231	

Nested Design

Source	SS	df	MS	F
A	2.0792	1	2.0792	1.4904
B	.7011	1	.7011	.5027
A x B	.1610	1	.1610	.1155
C/AB	16.7343	12	1.3945	1.4746
S/ABC	60.5255	64	.9457	
Tot.	80.2010	79		

Table Value for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	2.0792	1	2.0792	2.0453
B	.7011	1	.7011	.6896
A x B	.1610	1	.1610	.1584
WG	77.2597	76	1.0165	
Tot.	80.2010	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 785 >.05
 Not significant

A = mode
 B = order
 C/AB = error term for A,B, A x B
 S/ABC = error term for A/AB
 WG = pooled error term

2x2x4 Nested Factorial

Forest Ranger

Individual % Data

Bales Category 10 - Disagrees

Means

Mode of Communication

Order of Problem		Mode of Communication		
		FTF	CC	
1st		2.729	1.9555	2.3422
	2nd	4.8522	2.3861	3.6191
		3.7906	2.1708	

Nested Design

Source	SS	df	MS	F
A	52.4734	1	52.4734	5.7881*
B	32.6082	1	32.6082	3.5969
A x B	14.3253	1	14.3253	1.5802
C/AB	108.7885	12	9.0657	.7460
S/ABC	777.7594	64	12.1524	
Tot,	985.9548	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 * Significant

Pooled ANOV

The following pooled design is not really necessary since one finds the variables significant as above.

Source	SS	df	MS	F
A	52.4734	1	52.4734	4.4983*
B	32.6082	1	32.6082	2.7954
A x B	14.3253	1	14.3253	1.2280
WG	886.5478	76	11.6651	
Tot.	985.9548	79		

Table Value for F
 1 and 76 df = 3.97
 = 588.5* <.05
 * Significant

A = mode
 B = order
 C/AB = error term for A,B, A x B
 S/ABC = error term for C/AB
 WG = pooled error term

The nested design yields a significant difference between the FTF and CC conditions. The FTF conditions show a greater percent of their comments in category 10 - Disagrees.

2x2x4 Nested Factorial

Forest Ranger

Individual % Data

Bales Category 11 - Shows Tension

Means

Mode of Communication

Order of Problem		Mode of Communication		
		FTF	CC	
Order of Problem	1st	.2823	1.6823	.9823
	2nd	1.3294	2.6420	1.9857
		.8058	2.1621	

Nested Design

Source	SS	df	MS	F
A	36.7910	1	36.7910	5.0761*
B	20.1362	1	20.1362	2.7782
A x B	.0382	1	.0382	.0053
C/AB	86.9746	12	7.2478	1.7378
S/ABC	266.9247	64	4.1706	
Tot.	410.8647	79		

Table Value for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 * Significant

Pooled ANOV

Source	SS	df	MS	F
A	36.7910	1	36.7910	7.9009*
B	20.1362	1	20.1362	4.3243*
A x B	.0382	1	.0382	.0082
WG	353.8992	76	4.6565	
Tot.	410.8647	79		

Table Value for F
 1 and 76 df=3.97
 M.W.U. = 941 >.05
 * Significant

A = mode
 B = order
 C/AB = error term for A,B, A x B
 S/ABC = error term for C/Ab
 WG = pooled error term

The nested design yields a significant difference between the FTF and CC conditions. The CC conditions shows a greater percent of their comments in category 11 - Shows Tension.

2x2x4 Nested Factorial

Forest Ranger

Individual % Data

Bales Category 12 - Shows Antagonism

Means

Mode of Communication

Order of Problem		Mode of Communication		
		FTF	CC	
Order of Problem	1st	.7327	1.9470	1.3398
	2nd	.7663	1.3842	1.0752
		.7495	1.6656	

Nested Design

Source	SS	df	MS	F
A	16.7848	1	16.7848	1.0658
B	1.4003	1	1.4003	.0889
A x B	1.7785	1	1.7785	.1129
C/AB	188.9775	12	15.7481	1.3681
S/ABC	736.6981	64	11.5109	
Tot.	945.6392	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	16.7848	1	16.7848	1.3781
B	1.4003	1	1.4003	.1150
A x B	1.7785	1	1.7785	.1460
WG	925.6756	76	12.1799	
Tot.		945.6392	79	

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 803 >.05
 Not significant

A = mode
 B = order
 C/AB = error term for A,B, A x B
 S/ABC = error term for C/AB
 WG = Pooled error term

Nested Factorial
 Computer Conferencing
 Individual & Data
 Bales Category 1 - Shows Solidarity

Means

		Problem Type		
		Forest	Arctic	
Order of Problem	1st	2.7894	2.4348	2.6121
	2nd	3.6413	2.44375	3.042525
		3.21535	2.439275	

Nested Design

Source	SS	df	MS	F
A	12.045848	1	12.045848	1.457925
A	3.705314	1	3.705314	.0448459
A x B	3.552824	1	3.552824	.430003
C/AB	99.147884	12	8.262323	2.174153*
S/ABC	243.21601	64	3.80025	
Total	361.667879	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 M.W.U. = 960.5 >.05
 * Significant

A = Problem Type
 B = Order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB

Cannot Pool - Group Significant

Nested Factorial
Computer Conferencing
Individual % Data

Bales Category 2 - Shows Tension Release

Means

		Problem Type		
		Forest	Arctic	
Order of Problem	1st	.7550	1.4824	1.1187
	2nd	.9147	1.7114	1.31305
		.834850	1.5969	

Nested Design

Source	SS	df	MS	F
A	11.614404	1	11.614404	1.844338
B	.755438	1	.755438	.119962
A x B	.024012	1	.024012	.003813
C/AB	75.567959	12	6.297329	1.457038
S/ABC	276.608530	64	4.322008	
Total	364.570345	79		

Table Values for F
1 and 12 df = 4.75
12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	11.614404	1	11.614404	2.506399
B	.755438	1	.755438	.163024
A x B	.024012	1	.024012	.005182
WG	352.170489	76	4.633901	
Total	364.570345	79		

Table Value for F
1 and 76 df = 3.97

M.W.U. = 548* <.05
* Significant

A = Problem Type
B = Order
C/AB = error term for A, B, A x B
S/ABC = error term for C/AB
WG = pooled error term

2x2x4 Nested Factorial

Computer Conferencing

Individual % Data

Bales Category 3 - Agrees

Means

		Problem Type		
		Forest	Arctic	
Order of Problem	1st	5.46455	6.3342	5.899375
	2nd	4.118350	7.3116	5.714975
		4.79145	6.8229	

Nested Design

Source	SS	df	MS	F
A	82.535782	1	82.535782	2.798009
B	.680067	1	.680067	.023055
A x B	26.995585	1	6.995585	.915165
C/AB	353.97654	12	29.498045	1.548726
S/ABC	1218.985921	64	19.046655	
Total	1683.173896	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	82.535782	1	82.535782	3.987838*
B	.680067	1	.680067	.032858
A x B	26.995595	1	26.995595	1.304331
WG	1572.962461	76	20.6987838	
Total	1683.173896	79		

Table Values for F
 1 and 76 df = 3.97
 M.W.U. = 535* <.05
 * Significant

A = Problem Type
 B = Order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB
 WG = pooled error term

The pooled design yields a significant difference between the forest ranger and the arctic problems. The arctic problem elicited a greater percentage of comments in category 3 - Agrees.

2x2x4 Nested Factorial

Computer Conferencing

Individual % Data

Bales Category 4 - Gives Suggestion

Means

Problem Type

Forest Arctic

Order of Problem	1st	9.370	6.1654	7.7677
		2nd	9.0513	3.6118
		9.2107	4.8886	

Nested Design

Source	SS	df	MS	F
A	373.636901	1	373.636901	4.353747
B	41.262026	1	41.262026	.480799
A x B	24.964951	1	24.964951	.2909
C/AB	1029.835399	12	85.819616	.79885
S/ABC	6875.451542	64	107.428930	
Total	8345.15082	79		

Tables Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled AVOV

Source	SS	df	MS	F
A	373.636901	1	373.636901	3.592078
B	41.262026	1	41.262026	.396686
A x B	24.964951	1	24.964951	.240009
WG	7905.286941	76	104.016933	
Total	8345.15082	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 979 >.05
 Not Significant

A = Problem Type
 B = Mode
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB
 WG = pooled error term

2x2x4 Nested Factorial

Computer Conferencing

Individual & Data

Bales Category 5 - Gives Opinion

Means

Order of Problem		Problem Type		
		Forest	Arctic	
		1st	50.6364	
2nd	53.9285	58.1476	56.038050	
		52.28245	57.800625	

Nested Design

Source	SS	df	MS	F
A	609.005107	1	609.005107	2.653122
B	79.442973	1	79.442973	.346092
A x B	33.751917	1	33.751917	.147040
C/AB	2754.51353	12	229.542794	1.429580
Total	13752.97516	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	609.005107	1	609.005107	3.551929
B	79.442973	1	79.442973	.463339
A x B	33.751917	1	33.751917	.196853
WG	13030.77516	76	171.457567	
Total	13752.97516	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 594 < .05
 * significant

A = problem type
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB
 WG = pooled error term

2x2x4 Nested Factorial

Computer Conferencing

Individual % Data

Bales Category 6 - Gives Orientation

Means

		Problem Type		
		Forest	Arctic	
Order of Problem	1st	17.3087	12.74845	15.028575
	2nd	14.8941	10.88455	12.889325
		16.1014	11.8165	

Nested Design

Source	SS	df	MS	F
A	367.20736	1	367.20736	3.646091
B	91.528711	1	91.527811	.908802
A x B	1.516353	1	1.516352	.015056
C/AB	1208.55144	12	100.712620	2.634696*
S/ABC	2446.433252	64	38.225519	
Total	4115.236216	79		

Table Values for F
 land 12 df = 4.75
 12 and 64 df = 1.90
 M.W.U. = 1134* <.05
 * Significant

A = problem type
 B = order
 C/AB = error term for A, B, A X B
 S/ABC = error term for C/AB

Cannot Pool - Group Significant

Nested Factorial
Computer Conferencing
Individual & Data

Bales Category 7 - Asks for Orientation

Means

		Problem Type		
		Forest	Arctic	
Order of Problem	1st	1.4789	1.617	1.5481
	2nd	1.6908	1.624	1.6574
		1.58485	1.6205	

Nested Design

Source	SS	df	MS	F
A	.026064	1	.026064	.003121
B	.239586	1	.239586	.028687
A x B	.209920	1	.209920	.025135
C/AB	100.219276	12	8.351606	3.1109*
S/ABC	171.816127	64	2.684626	
Total	272.510973	79		

Table Values for F
1 and 12 df = 4.75
12 and 64 df = 1.90
M.W.U. = 749 >.05
* Significant

A = problem type
B = order
C/AB = error term for A, B, A x B
S/ABC = error term for C/AB

Cannot Pool - Group significant

2x2x4 Nested Factorial

Computer Conferencing

Individual % Data

Bales Category 8 - Asks for Opinion

Means

		Problem Type		
		Forest	Arctic	
Order of Problem	1st	6.1273	8.19555	7.161425
	2nd	4.5842	6.7294	5.6568
		5.35575	7.462475	

Nested Design

Source	SS	df	MS	F
A	88.871172	1	88.871172	2.26653
B	45.202728	1	45.202728	1.15283
A x B	.027714	1	.027714	.000707
C/AB	470.522737	12	39.210228	1.530288
S/ABC	1639.857459	64	25.62272	
Total	2244.48181	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	88.871172	1	88.871172	3.20047
B	45.202728	1	45.202728	1.627862
A x B	.027714	1	.027714	.000998
WG	2110.380196	76	27.76816	
Total	2244.48181	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 557* <.05
 * significant

A = problem type
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB
 WG = pooled error term

2x2x4 Nested Factorial

Computer Conferencing

Individual % Data

Bales Category 9 - Asks for Suggestion

Means

Problem Type

Forest Arctic

Order of Problem		Forest	Arctic	
1st		.4847	.4926	.48865
2nd		.76165	.6704	.710625
		.623175	.5815	

Nested Design

Source	SS	df	MS	F
A	.034736	1	.034736	.015678
B	1.033988	1	1.033988	.466693
A x B	.049154	1	.049154	.022186
C/AB	26.586783	12	2.215565	2.118703*
S/ABC	66.925927	64	1.045717	
Total	94.630588	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 M.W.U. = 740.5 > .05
 * Significant

A = problem type

B = order

C/AB = error term for A, B, A x B

S/ABC = error term for C/AB

Cannot Pool - Group Significant

2x2x4 Nested Factorial

Computer Conferencing

Individual % Data

Bales Category 10 - Disagrees

Means

		Problem Type		
		Forest	Arctic	
Order of Problem	1st	1.95555	1.75625	1.8559
	2nd	2.3861	3.16555	2.775825
		2.170825	2.46090	

Nested Design

Source	SS	df	MS	F
A	1.68287	1	1.68287	.144804
B	16.92524	1	16.92524	1.45635
A x B	4.789758	1	4.789758	.41214
C/AB	139.460225	12	11.621685	1.836788
S/ABC	404.939393	64	6.327178	
Total	567.797485	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	1.68287	1	1.68287	.234934
B	16.92524	1	16.92524	2.36282
A x B	4.789758	1	4.789758	.668666
WG	544.399617	76	7.163152	
Total	567.797485	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 704.5 >.05
 Not significant

A = problem type
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB

2x2x4 Nested Factorial

Computer Conferencing

Individual % Data

Bales Category 11 - Shows Tension

Means

Order of Problem		Problem Type		
		Forest	Arctic	
1st		1.6823	.5850	1.13365
	2nd	2.642	.7025	1.67225
		2.16215	.64375	

Nested Design

Source	SS	df	MS	F
A	46.110771	1	46.110771	7.405121*
B	5.801799	1	5.801799	.931735
A x B	3.546504	1	3.546504	.569548
C/AB	74.722518	12	6.226876	1.611501
S/ABC	247.297530	64	3.864023	
Total	377.479122	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 * Significant

Pooled ANOV

Source	SS	df	MS	F
A	46.110771	1	46.110771	10.88261*
B	5.801799	1	5.801799	1.369284
A x B	3.546504	1	3.546504	.837011
WG	322.020047	76	4.237105	
Total	377.479122	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 964.5 >.05
 * Significant.

A = problem type
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB

The nested design yields a significant differenc between the forest ranger and arctic problems. The forest ranger problem elicited a greater percentage of comments in category 1 - Shows Tension.

2.2x4 Nested Factorial

Computer Conferencing

Individual % Data

Bales Category 12 - Shows Antagonism

Means

Order of Problem		Problem Type		
		Forest	Arctic	
1st		1.9470	.73495	1.340975
	2nd	1.38420	2.9971	2.190650
		1.6656	1.866025	

Nested Factorial

Source	SS	df	MS	F
A	.803404	1	.803404	.040653
B	14.438952	1	14.438952	.730655
A x B	39.901713	1	39.901713	2.019148
C/AB	237.139936	12	19.761661	1.419607
S/ABC	890.91285	64	13.920513	
Total	1183.196854	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	.803404	1	.803404	.054127
B	14.438952	1	14.438952	.972792
A x B	39.901713	1	39.901713	2.688287
WG	1128.052785	76	14.842799	
Total	1183.196854	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 688 >.05
 Not significant

A = problem type
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB
 WG = pooled error term

2x2x4 Nested Factorial

Face to Face

Individual % Data

Bales Category 1 Shows Solidarity

Means

		Problem Type		
		Forest	Arctic	
Order of Problem	1st	.98505	1.68935	1.3372
	2nd	.58505	1.622850	1.10395
		.78505	1.6561	

Nested Design

Source	SS	df	MS	F
A	15.174562	1	15.174562	4.504514
B	1.088111	1	1.088111	.323002
A x B	.556111	1	.556111	.16508
C/AB	40.424947	12	3.368745	2.775302*
S/ABC	77.685128	64	1.21383	
Total	134.92886	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

M.W.U. = 503.5* <.05
 * Significant

A = problem type
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB

2x2x4 Nested Factorial

Face to Face

Individual % Data

Bales Category 2 - Shows Tension Release

Means

Problem Type

Forest Arctic

Order of Problem	1st	Problem Type		5.43425
		Forest	Arctic	
	2nd	3.42675	9.0609	6.243825
		3.978325	7.69975	

Nested Design

Source	SS	df	MS	F
##### A	276.980081	1	276.980081	11.488122*
B	13.108234	1	13.108234	.543682
A x B	73.170339	1	73.170339	3.034838
C/AB	289.321526	12	24.110127	1.339326
S/abc	1152.10778	64	18.001684	
Total	1804.687959	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 * Significant

Pooled ANOV

Source	SS	df	MS	F
A	276.980081	1	276.980081	14.603898*
B	13.108234	1	13.108234	.691137
A x B	73.170339	1	73.170339	3.857939
WG	1441.429306	76	18.966175	
Total	1804.687959	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 418* <.05

A = problem type

B = order

C/AB = error term for A, B, A x B

S/ABC = error term for C/AB

WG = pooled error term

The nested design yields a significant difference between the forest ranger and arctic problems. The arctic problem elicited a greater percentage of comments in category 2 - Shows Tension Release.

2x2x4 Nested Factorial

Face to Face

Individual % Data

Bales Category 3 - Agrees

Means

Problem Type

Forest Arctic

Order of Problem	1st	14.1900	14.27695	14.233475
	2nd	12.19215	12.4207	12.306425
		13.191075	13.348825	

Nested Factorial

Source	SS	df	MS	F
A	.497701	1	.497701	.00528
B	74.270434	1	74.270434	.787913
A x B	.100253	1	.100253	.001064
C/AB	1131.146534	12	94.262211	1.46339
S/ABC	4122.468810	64	64.413575	
Total	5328.483732	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	.497701	1	.497701	.0072
B	74.270434	1	74.270434	1.074413
A x B	.100253	1	.100253	.00145
WG	5253.615343	76	69.126517	
Total	5328.483732	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 710.5 >.05

A = problem type
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB
 WG = pooled error term

2x2x4 Nested Factorial

Face to Face

Individual % Data

Bales Category 4 - Gives Suggestion

Means

Order of Problem		Problem Type		
		Forest	Arctic	
		1st	6.7476	
2nd	2.6623	4.17385	3.418075	
	4.70495	3.563975		

Nested Factorial

Source	SS	df	MS	F
A	26.036479	1	26.036479	.723801
B	41.056884	1	41.056884	1.14136
A x B	140.717778	1	140.717778	3.911882
C/AB	431.662694	12	35.971891	.662398
S/ABC	3475.553021	64	54.305515	
Total	4115.026856	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	26.036479	1	26.036479	.506441
B	41.056884	1	41.056884	.798605
A x B	140.717778	1	140.717778	2.737128
WG	3907.2157150	76	51.410733	
Total	4115.026856	79		

Table Value for F
1 and 76 df = 3.97
M.W.U>. = 696.5 >.05
Not significant

A = problem type

B = order

C/AB = error term for A, B, A x B

S/ABC = error term for C/AB

WG = pooled error term

2x2x4 Nested Factorial

Face to Face

Individual % Data

Bales Category 5 - Gives Opinion

Means

Problem Type

Forest Arctic

Order of Problem	1st	51.2751	44.7575	48.0163
		54.21195	41.2266	47.719275
	2nd	52.743525	42.992050	

Nested Factorial

Source	SS	df	MS	F
A	1901.825294	1	1901.825294	7.326579*
B	1.764477	1	1.764477	.006797
A x B	209.158950	1	209.158950	.805763
C/AB	3114.946791	12	259.578899	1.519203
S/ABC	10935.37353	64	170.865211	
Total	16163.06905	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 * Significant

Pooled ANOV

Source	SS	df	MS	F
A	1901.825194	1	1901.825294	10.287219*
B	1.764477	1	.006797	.009544
A x B	209.158950	1	209.158950	1.131368
WG	14050.32032	76	184.872633	
Total	16163.06905	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 1103* <.05
 * Significant

A = problem type
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB
 WG = pooled error term

The nested design yields a significant difference between the forest ranger and arctic problems. The forest ranger problem elicited a greater percentage of comments in category 5 - Gives Opinion.

2x2x4 Nested Factorial

Face to Face

Individual % Data

Bales Category 6 - Gives Orientation

Means

Order of Problem		Problem Type		
		Forest	Arctic	
		1st	12.6934	
2nd		12.9207	15.4825	14.2016
		12.80705	14.5794	

Nested Factorial

Source	SS	df	MS	F
A	62.813857	1	62.813857	1.674483
B	20.667478	1	20.667478	.550951
A x B	12.458311	1	12.458311	.332112
C/AB	450.148741	12	37.512395	1.108594
S/ABC	2165.620889	64	33.837826	
Total	2711.709276	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	62.813857	1	62.813857	1.825028
B	20.667478	1	20.667478	.600484
A x B	12.458311	1	12.458311	.361971
WG	2615.769630	76	34.418021	
Total	2711.709276	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 721 >.05
 Not significant

A = problem type

B = order

C/AB = error term for A, B, A x B

S/ABC = error term for C/AB

WG = pooled error term

2x2x4 Nested Factorial

Face to Face

Individual % Data

Bales Category 7 - Asks for Orientation

Means

Problem Type

Order of Problem		Forest	Arctic	
		1st	2.8369	
2nd		3.6967	4.3079	4.00230
		3.2668	3.72125	

Nested Design

Source	SS	df	MS:F	
A	4.130496	1	4.130496	.373909
B	20.667478	1	20.667478	1.870903
A x B	.491411	1	.491411	.044485
C/AB	132.561481	12	11.04679	1.478899
S/ABC	478.054534	64	7.469602	
Total	635.905434	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	4.130496	1	4.130496	.5141
B	20.667478	1	20.667478	2.572367
A x B	.491411	1	.491411	.061163
WG	610.616048	76	8.034421	
Total	635.905434	79		

Table Value for F
 1 and 76 df = 3.97
 M.W.U. = 693.5 >.05
 Not significant

A = problem type
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB
 WG = pooled error term

2x2x4 Nested Factorial

Face to Face

Individual % Data

Bales Category 8 - Asks for Opinion

Means

Problem Type

Forest Arctic

Order of Problem	1st	2.7485	5.4166	4.0817
	2nd	3.007	4.885	3.946
		2.8764	5.1513	

Nested Design

Source	SS	df	MS	F
A	103.471554	1	103.471554	8.37962*
B	.36477	1	.36477	.029541
A x B	3.144245	1	3.144245	.254636
C/AB	148.176009	12	12.348	1.682143
S/ABC	469.800692	64	7.340635	
Total	724.95727	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 M.W.U. = 443.5* <.05
 * Significant

Pooled ANOV

Source	SS	df	MS	F
A	103.471554	1	103.471554	12.725137*
B	.36477	1	.36477	.04486
A x B	3.144245	1	3.144245	.386685
WG	617.9767	76	8.131272	
Total	724.95727	79		

Table Value for F
1 and 12 df=3.97
* Significant

A = problem type
B = order
C/AB = error term for A, B, A x B
S/ABC = error term for C/AB
WG = pooled error term

The nested design yields a significant difference between the forest ranger and arctic problems. The arctic problem elicited a greater percentage of comments in category 8 - Asks for Opinion.

2x2x4 Nested Factorial

Face to Face

Individual % Data

Bales Category 9 - Asks for Suggestion

Means

		Problem Type		
		Forest	Arctic	
Order of Problem	1st	.2520	1.176750	.714375
	2nd	.3495	1.10025	.724875
		.30075	1.1385	

Nested Design

Source	SS	df	MS	F
A	14.036501	1	14.036501	3.947409
B	.002205	1	.002205	.00062
A x B	.15138	1	.15138	.042572
C/AB	42.670528	12	3.555877	3.713627*
S/ABC	61.281363	64	.957521	
Total	118.141977	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 M.W.U. = 506* <.05
 * Significant

A = problem type
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB

Cannot Pool - Group Significant

2x2x4 Nested Factorial

Face to Face

Individual % Data

Bales Category 10 - Disagrees

Means

		Problem Type		
		Forest	Arctic	
Order of Problem	1st	2.729	4.18425	3.456625
	2nd	4.8522	2.84225	3.847225
		3.7906	3.51325	

Nested Design

Source	SS	df	MS	F
A	1.53846	1	1.53846	.097822
B	3.051367	1	3.051367	.194020
A x B	60.038055	1	60.038055	3.817492
C/AB	188.72511	12	15.727092	1.512695
S/ABC	665.390993	64	10.396734	
Total	918.743986	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90

Pooled ANOV

Source	SS	df	MS	F
A	1.53846	1	1.53846	.136894
B	3.051367	1	3.053846	.271513
A x B	60.038055	1	60.038055	5.342239*
WG	854.116102	76	11.238369	
Total	918.743986	79		

Table Value for F
1 and 76 df = 3.75
M.W.U. = 774.5 >.05
* Significant

A = problem type
B = order
C/AB = error term for A, B, A x B
S/ABC = error term for C/AB
WG = pooled error term

2x2x4 Nested Factorial

Face to Face

Individual & Data

Bales Category 11 - Shows Tension Release

Means

Problem Type

Order of Problem		Forest	Arctic	
		1st	.2823	1.6223
2nd		1.3294	1.42345	1.376425
		.80585	1.522875	

Nested Design

Source	SS	df	MS	F
A	10.282497	1	10.282497	3.088246
B	3.59764	1	3.59764	1.080516
A x B	7.761957	1	7.761957	2.331227
C/AB	39.954703	12	3.329558	1.95038*
S/ABC	109.256530	64	1.707133	
Total	170.853326	79		

Table Values for F
 1 and 12 df = 4.75
 12 and 64 df = 1.90
 M.W.U. = 569* <.05
 * Significant

A = problem type
 B = order
 C/AB = error term for A, B, A x B
 S/ABC = error term for C/AB

Cannot Pool - Group Significant

Face to Face
Individual % Data
Bales Category 12 - Shows Antagonism

Means

		Problem Type		
		Forest	Arctic	
Order of Problem	1st	.7327	.772	.75235
	2nd	.7663	1.45385	1.110075
		.7495	1.1129	

Nested Design				
Source	SS	df	MS	F
A	2.640464	1	2.640464	.535181
B	2.560417	1	2.560417	.518956
A x B	2.102113	1	2.102113	.426065
C/AB	59.205371	12	4.93378	2.214985*
S/ABC	142.557135	64	2.227455	
Total	209.0655	79		

Table Values for F
1 and 12 df = 4.75
12 and 64 df = 1.90
M.W.U. = 674 >.05
* Significant

A = Problem Type
B = Order
C/AB = error term for A, B, A x B
S/ABC = error term for C/AB

Cannot Pool - Group Significant