A COMPUTER ASSISTED HUMAN RELATIONS TRAINING TOOL
FOR SMALL GROUP INTERACTIONS

by

James L. Ayers (1) and Stewart A. Haight (2)

(1) Assistant Professor, Program in Health Psychology, School of
Public Health, University of Minnesota, Box 717 Mayo Memorial
Building, 420 Delaware St. S.E., Minneapolis, Minnesota,
55455 (612-373-1910)

(2) Health Information Resources, Inc., P.O. Box 14648,
Minneapolis, Minnesota, 55414 (612-644-4375)

Abstract

This paper describes the most recent developments of MAGLE-G (Minnesota Automated
Guided Interaction Enhancement - Group version). MAGLE-G is an interactive video/microcomputer
system designed to help participants in various kinds of small group meetings assess their
face-to-face interactions with each other. This takes place in three stages. First, the group
session is recorded on video tape. Next, all the group members view a video monitor presenting
playback of their small group session while at the same time answering a sequence of questions
systematically presented on a second monitor by a microcomputer. Immediately after viewing their
tape, group members can receive feedback in the form of colored bar graphs, summarizing their
responses to specific questions and allowing them to study changes in their responses over the
course of their group session. Because MAGLE-G is a fully interactive video-computer system, the
group can use the graphs to identify critical moments in their group session and instruct the
microcomputer to play back those moments on the video tape for further analysis and group
discussion. In addition to describing the operation of MAGLE-G, this paper also discusses
the relevance of this procedure to enhance small group interactions together with some
illustrative data, and directions for future development.

Background

Face-to-face human interaction, in dyads or in small groups, is the primary means of health
services delivery whether it be between care provider and patient, delivery staff, or extensive
administrative meetings. While it is commonly assumed that this direct human interaction is
vital not only to effective health services delivery but to all phases of human life, the
actual interactive process itself is surprisingly resistant to systematic scientific study.
Scientific inquiry requires very acceptable instrumentation so that findings by different
people can be objectively compared and tested. Few of these minimal requirements for scientific
inquiry have been reached as regards the face-to-face interactions, which are perhaps the
most frequent, basic, and overlooked of all human behaviors. Although face-to-face interactions
have been the object of extensive empirical studies with increasingly more sophisticated
instrumentation, much of the research has been confined to a controlled laboratory. The end
result is that most of what is known about face-to-face interactions which actually occur in
health care settings is based on data which is mostly: 1) anecdotal, resulting from retrospective
reports of single observers, 2) one-sided, being provided usually by those with more recognized
authority, and 3) vague with little reference to specific, objectively measurable details.

One major result of this state of affairs is that training of health services professionals is
often weakest in the area of human interaction skills, be it interviewing, interdisciplinary
teamwork, or administrative collaboration. While this is in part due to the limited scientific
knowledge about human interaction, other reasons have to do with educational issues and training
methodology. The educational issues regarding human relations training arise from the fact that
the skills are complex and individuals differ in their ability to learn and apply the skills.
Effective learning of human relations/interaction skills appears to be highly individualized,
requiring active involvement by individual learners. To address the issue of individualized
learning some training methodologies have made use of video tape feedback, while the
effectiveness of video tape feedback in learning face-to-face interaction skills has been amply
demonstrated, at least in certain settings, these methods still have some practical limitations.
They are rather complex for trainers to apply on a wide scale, and the video tape technology is
really not used very much by the trainees.

Methodology

In an effort to address the research and educational problems inherent in face-to-face
interaction skills, development began several years ago on a procedure that would build on
previous work yet be practical and efficient. The earliest instrumentation incorporated the
principle developed by Kagan in the Interpersonal Process Recall (IPR) procedure, viz. that
video tape playback is a powerful stimulus for people recalling experiences that initially
took place in a face-to-face interaction. In the IPR procedure participants view their video tape
playback in the presence of
a trained inquirer who tries to help them stop the tape and verbalize their recollections. The new procedure, called the Interpersonal Tracking Task (ITT) in effect replaced the human inquirer with a second video tape monitor which asked questions of the viewers and a special apparatus which allowed them to answer these questions, without stopping the video tape. A pilot study efficiently demonstrated the feasibility of this approach that the next step was to computerize the ITT for application in dyadic face-to-face interactions. The computerized ITT begins with a video tape recording of a face-to-face interaction, such as between a physician and patient. Upon completion of this interaction, both participants sit down before two video tape monitors, one on top of the other. The top monitor presents the video tape playback, and on the bottom monitor is presented a structured sequence of questions from a microcomputer. By rotating a handheld dial control connected to the computer, each participant can move a cursor on the computer screen and answer the questions. The ITT questions were presented at a steady rate (15 second intervals) in a repetitive, structured sequence so that extensive data analysis was possible. Because the entire system is microcomputer based, feedback of the data analysis is virtually immediate and presented in two forms: a summary statistical report and a series of colored bar graphs. A key component of the ITT is the interactive video control computer card which permits participants using the colored graphs to find and replay specific points on the video tape which correspond to specific responses to questions. This feature helps participants identify and further discuss critical points in their interaction. Computerizing the ITT had three major benefits by: 1. greatly expanding the level of development, more simple. Both the dyadic and group versions are automated procedures for guiding participants in objectively assessing their face-to-face interactions with each other for the purpose of enhancing their mutual understanding and collaboration. A more descriptive name for this procedure was chosen to reflect this process, 

Nautilus (Minneapolis automated guided interaction enhancement). Nautilus is the dyadic version (replacing the former name of Interpersonal Tracking Task), and Nautilus is the group version. Like the dyadic version, Nautilus had three distinct stages: video taping, video tape viewing together with question answering, and an analysis/feedback stage. Each stage involves various degrees of computer assistance.

Nautilus Stage 1: Video Tape Recording

In the video taping stage a small group session of 3 to 6 people is video tape recorded. The group task may range from a small group psychotherapy session to a formal business/administrative meetings. Before the small group session starts, the computer screen prompts participants to turn on and adjust the video tape recorder, camera, and microphone. The camera is set at eye level and focused directly on all participants who sit in a horse shoe pattern with the camera at the open end of the circle. The video camera remains stationary throughout the entire group session. This results in some loss of visual detail when the group has more than a dozen members, but the primary purpose of the video record is to help all participants equally in recalling, the events of their meeting. Thus, minimal editing is done to the video record as it is being made so as to record all participants equally. This also eliminates the need of a camera person outside the group session itself. A single press of a computer key starts the video tape recording process, and the group goes about its business, generally, about 10 to 60 minutes. When their business is over, a member signals the computer to stop the video tape recording, rewind the tape, and prepare the group for the second stage of Nautilus.

Nautilus Stage 2: Tape Playback and Assessment

The second stage involves participants in viewing their video tape, nonstop from start to finish, while privately answering questions presented on a second monitor by the computer. This stage involves the following steps:

1. A mark sense computer card and soft pencil are given to each group member. The cards, in conjunction with a mark sense card reader which is connected to the microcomputer, allow each participant to answer the Nautilus questions privately. The card format is one commonly used, consisting of a subject identification field and an item response field for 100 multiple-choice questions.

2. Before participants view their video tape, they are asked how much of the video tape they wish to view. In addition they are asked to
answer the first two questions on the card. These questions are presented on the computer screen and are determined ahead of time to identify some basic variables assumed to influence group participation. The first question, for example, can address role differentiation within the group (e.g. student-teacher, doctor-patient, supervisor-supervisee, etc.). The second question has the participants indicate their gender, since gender is often a major factor in group interactions. All of the instructions and questions in MAGIE-U are in large type by means of a high resolution character generating computer program. This permits everyone, even in large groups, to easily read questions even from a single monitor. Figure 1 depicts a sample of the first question.

Question #1

Are you a member of the administrative team?

A. Yes
B. No

Hit key when ready.

Figure 1

When these questions have been answered and everyone is ready, presentation of the video tape playback and questions can begin.

3. Everyone in the group can see both the entire video screen and the entire question screen which is under it. Once the video tape playback starts, the questions are presented one at a time at a steady rate (30-second intervals). An audio tone from the computer signals the group at the onset of each question. While a trainer using MAUL-U can easily modify the kind, number, frequency, and duration of each question, because the data collection is computer controlled, a number of questions have been used in MAGIE-U development. These questions are of two types, affect and content. The affect questions ask participants to describe how they were feeling; the content questions involve participants in assessing their interaction. Below each question is a five-choice response scale, corresponding to five choices for each item on the computer card. Figure 2 depicts a sample content question. As they watch their tape nonstop from start to finish, group members are requested to answer their questions in silence, lest their remarks or nonverbal reactions influence other group members. When they have viewed the amount of tape they initially requested, the computer stops the video player, rewinds the tape and asks that the computer cards be collected for scoring.

4. The completed card of each group member is passed through the mark-sense card reader connected to the computer. Once all cards have been read, the data is stored on the computer disk file for later use.

Question #4

Here we're talking about what I want to talk about

A. Not at all
B. A little
C. Moderately
D. Quite a bit
E. Very much

Figure 2

MAUL-U Stage 3: Getting And Giving Feedback

In the third stage of MAUL-U group members receive immediate feedback of their group results in the form of colored graphs. Figure 3 is a screen dump of one of the colored graphs summarizing the responses to the question "Here we're talking about what I want to talk about" which was asked of seven group members every two minutes as they watched their tape.

Response to 'Here we're talking about what I want to talk about'
Arranged by 'What gender are you?'

Figure 3

The graph in Figure 3 depicts the mean responses to this question arranged by gender. The height of the bars represents the mean response along the five-point scale, and the numbers below each pair of bars indicates the minute during which responses were made to the question. The prompts at the bottom of the screen allow the group members to access other graphs, see a particular minute of video tape suggested by the graph, or exit to the MAUL-U control menu. The graph in Figure 3 shows some typical patterns. First,
responses vary over time yet in some patterned way and lend support to the MAUL inquiry strategy which asks participants at regular intervals rather than asking for a single global response at the end of an interaction. Second, there are usually differences in male-female responses (e.g. at minutes 11 and 15) which are not readily apparent even to the participants themselves. Yet when the group members use the computer to access what the graphs suggest are critical minutes, they can give each other more specific feedback to become more aware of subtle yet quite important differences in their separate points of view. Such results are not uncommon.

Hardware

The microcomputer chosen was Apple II with 48k memory, Applesoft card, two floppy disk drives, a Mountain Hardware clock/calendar card, a Whitney video interface card, a Chatsworth data Corp. mark sense card reader, and a standard 13-inch color television. The total computer system cost was about $4,450 including educational discounts. The Apple was chosen primarily because of the extensive hardware and software support it receives at the University of Minnesota. The total video tape recording system cost was $1,596 which included a video tape cassette recorder, camera, and microphone.

Computer Software

The software package currently consists of three programs written in Applesoft basic. The functions these perform are:

1. Data collection -- present questions and accept data from mark sense cards completed by participants as they view their tape.
2. Graphics -- color graphic displays are generated comparing participants’ responses over time and arranged by some demographic variable such as gender and professional status.
3. Control -- controls movements of participants into appropriate programs.

As with the development of MAUL-U, a good deal of effort was spent making the program as user friendly and as fail-safe as possible. Approximately 150 hours of additional time was required for initial analyses, programming and testing.

Application

Current applications of MAUL-U have mainly involved limited use in such diverse areas as: 1) administrative team training, 2) interaction assessment of husband-wife with their co-therapists in couples therapy, 3) group counseling training, 4) supervision training of hospital chaplaincy personnel, 5) communication skills assessment in a high school social studies class, 6) small group interactions in chemical dependency treatment. Such field testing has suggested directions for future development which emphasize system integration and portability. These developments include:

1. A more versatile computer-video recorder interface card which could be closely integrated with the entire MAUL system. This card will include a separate microprocessor controller, communicating through a standard RS-232 serial interface.
2. Rewriting the software which is currently in Applesoft basic into a system written in a language (e.g. Pascal) which is more transportable across different microcomputers.
3. Expansion of existing software into a more complex yet fully integrated information management system with more flexible data analyses and retrieval.

The guiding principles for this development continue to come from psychological research on human learning, such as the principle of knowledge of results. More extensive field testing is anticipated in increasingly more diverse settings. This is expected to clarify other issues for MAUL development, such as practical ethical issues and programmatic planning of research.

References