A STUdy of the relationShIp between perSonality factors, attItudes, and measured content in a computerized counseling experience

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A STUDY OF THE RELATIONSHIP BETWEEN PERSONALITY FACTORS, ATTITUDES, AND MEASURED CONTENT IN A COMPUTERIZED COUNSELING EXPERIENCE

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ABSTRACT

A STUDY OF THE RELATIONSHIP BETWEEN PERSONALITY FACTORS AND ATTITUDES TOWARD A COMPUTERIZED COUNSELING EXPERIENCE

This study is an investigation of the correlations between personality factors of Extraversion and Neuroticism and attitudes as measured on nine scales developed for this purpose. A second major portion of the study is concerned with correlation of the above personality factors with a content analysis of the counseling interview.

An adaptation of an existing interactive computer program (Eliza) was used with 42 high school juniors and seniors randomly selected from a psychology class.

The students were administered the Eysenck Personality Inventory as a group. Subsequently, each student was individually exposed to the counseling program via a teletype terminal of a large computer. Following the counseling experience, the "Counseling Simulation Attitude Survey" was completed by the subject.

Analysis of the data consisted of simple correlation calculations using the Eysenck personality factors singly with each of the nine attitude scales. The content analysis was performed by the computer program yielding
data such as total word count and personal pronoun counts. These data together with the Eysenck scores were used in multiple correlation calculations.

Some sample conversations and their clinical possibilities are included. The results showed correlations to the .05 level between Extraversion as measured by the Eysenck and competitiveness and Neuroticism and anxiety. Significant multiple correlations were found between pronoun usage and the personality parameters.
ACKNOWLEDGMENT

There are several persons who have expended their energy on my behalf during this study. I wish to mention them and indicate their contribution.

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Mrs. Ruth Zeller for cheerfully rendering my scarcely legible handwriting into a readable draft.

Capt. Michael Wirth for the use of his computer terminal and time.

Not to be forgotten are those 42 anonymous high school students who gave up their lunch hours and time after school to take part in an experience which was a complete mystery to them. It is to them and their generation's future well being that this thesis is primarily dedicated.
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Chapter 1

INTRODUCTION

General Statement of the Problem

Computers are becoming increasingly more intrusive in the lives of all people in this country. In the past, we have not generally been aware of the steady encroachment of computer technology. Our involvement started when business began to rely on computers for billing. The telephone company went to all digit dialing and the internal revenue service to automated auditing.

At the same time, other uses of computers were being felt in less public areas. Newspapers and books are printed by computerized typesetting. Machine tools are controlled by computer programs and whole production lines managed by central computers. The Bay Area Rapid Transit System will soon be in operation and a large segment of a metropolitan area will be tended by computers which will control ticketing, transfers, and the trains themselves.

Of more immediate concern in this study is the growing number of situations in which a single individual is confronted by a computer in a personal interaction. Some common examples are computerized teaching machines, counseling services which dispense information, information
retrieval systems, and medical multiphasic examinations (Loughory, 1970; Connoly, 1970; Sicklossy, 1971; Slack, 1971).

The uses of computer mentioned above differ from that of the technician or scientist who uses the computer as a tool much as he would use a slide rule or desk calculator. The concern is not so much with the computer as a tool but as an active component of a dynamic interaction with a human being.

In the present study, the focus is on such a situation: the reactions of persons who become involved in such an interaction, and the correlations of these reactions with personality factors.

**Background of the Problem**

The present study has its roots in some personal experiences of the author during such interactions and in observations of others undergoing computer interaction experiences. The experiences revolve around the somewhat jocular use of a computer program which does a primitive sort of Rogerian counseling (Weizenbaum, 1966). The user is seated at a teletype machine and engages in a typewritten conversation with the computer which types its part of the conversation. There is no exposure to the popularized version of flashing lights and rotating tape machines. The user and the teletypewriter form an isolated system and
and most persons so engaged become involved to such an extent that basic personality characteristics begin to emerge. The hostile person begins to use abusive language. The competitive person begins to try to "figure it out" and outsmart the machine. The introspective person may be the most likely to become more involved since the program is designed to lead such a person deeper into personal disclosure. Some persons get so completely engrossed that they cannot easily terminate the simulated conversation.

During the period of observation, the author chanced to become a listener to a first hand account of a colleague's reactions to having his medical history taken by a computer. The man's reactions were of such a strong nature that the question of the effects on him of his interaction with the computer became a factor in the overall process.

Significance of the Problem

The question of the isolated system comes into the foreground. One the one hand is a relatively invariant entity (the computer) and on the other side of the interaction is a human with the tremendous variability which we know is possessed by our species. What do we know of the effects of such a process? Does the machine have to be an invariant? Can we devise ways for the machine to assess
the general personality type of its human companion and adjust its (the machine's) behavior accordingly so as to optimize the situation? Is the use of such computer oriented processes of potential harm?

These and scores of other questions come to mind. One thing is certain. We will see more and more use of the computer in the one-to-one interaction with humans. There are many questions to be asked and answers to be sought. It is not clear whether the designers of such machines and programs are professionally oriented so that they include psychological principles as well as engineering and systems analysis in their designs, (Walz, 1970; Tiedeman and Schmidt, 1970).

Some beginnings of measurement of the psychological parameters must be undertaken. This study is such an effort. The overall problem as outlined is of such magnitude that one can become lost in the maze of conjectures. In order to focus on an area which will yield some data of a general nature, this study is directed to the measurements of reactions to the interaction with the above mentioned counseling program coupled with measurement of some general parameters of personality.
Chapter 2

REVIEW OF PERTINENT LITERATURE

This chapter will deal with the various aspects of the interactive computer and artificial intelligence in general. The first section will be concerned with the specific counseling program which was used in this study. The next section will deal with the use of computerized aids in the educational field in general and the counseling field in particular. Following will be a brief overview of the types of computer assisted counseling systems. The last section will be devoted to a discussion of artificial intelligence and its probable impact on our society. The conclusions presented are supported by brief references to recent research which indicate that the technology for creating a perceptive interactive computer-ized counseling system exists now. A plea is made for the humanization of such systems and its integration into human therapeutic contacts as an aid and not a substitute for a flesh and blood partner.

The Computer Program

The computer program used in this study was adapted from a program developed at Massachusetts Institute
of Technology in 1966 and reported as "ELIZA - a Computer Program for the Study of Natural Language Communication Between Man and Machine" (Weizenbaum, 1966). The program makes it possible for a human to have a natural language conversation with the computer via a teletype. The program in its present form is rather primitive compared to what can potentially be achieved in this area, yet it has the advantage of providing an intelligent sounding conversation and users generally respond as if there is an intelligent being operating the teletype.

Details of the program are beyond the scope intended in the present writing and will tend to obscure the main thrust of the study and are therefore omitted. Some sample conversations are included in Chapter 3 together with a discussion of their possible clinical use. One point which is of importance is that the program is presently constructed so that it's responses are somewhat like those of a Rogerian counselor and the main thrust of the responses is to lead the human into deeper self disclosure.

Weizenbaum (1966:42) notes that the program "performs best when its human correspondent is initially instructed to 'talk' to it, via the typewriter of course, just as one would to a psychiatrist. This mode of conversation was chosen because the psychiatric interview
is one of the few examples of categorized dyadic natural language communication in which one of the participating pair is free to assume the pose of knowing almost nothing of the real world." The psychiatrist can be assumed to be uninformed about a subject and to have a definite purpose for asking for further information. The "patient" after making such an assumption can then maintain the belief that he is being heard and understood. Weizenbaum's point is that the human participant will generate the illusion of a genuine conversation in which the conversational partner need know nothing of the topic under discussion. This assumption enables the program to be free of the necessity of storing explicit information about the real world.

The technical reasons for selecting the psychotherapeutic mode of interaction were pertinent to the original purpose of ELIZA which was to explore the possibilities of having natural language conversations with a computer. The present study makes use of the program as a means of studying the relationship of such an integration with selected variates. Thus it is fortunate that the psychotherapeutic model was chosen in the development of ELIZA since it seems likely that many future uses of the interactive computer will indeed center about counseling (if not therapeutic) uses.
The Computer in Counseling

Super (1970) introduces the concept of the application of computers to the educational field in general and counseling in particular. The collection of papers presented are limited basically to computer aided educational and vocational guidance. Little mention is made of the use of the interactive computer as a means of aiding a person in personal problem solving activities. Chapter 3 of this study will illustrate the possible utility of such a program in two areas related to such counseling. First is the motivational aspect of novelty which can encourage a student to seek the aid of a counselor in order to probe his experience with the computer and secondly is the rich source of material which can be generated for use in a counseling interview prior to the consumption of human time and effort.

Super (1970:126) concludes as follows: "One thing is very clear: experimental systems will be tried out by a steadily increasing number of institutions and the demand for them will go up. Production costs will then almost inevitably go down, leading to increased demand and even more widespread adoption." With such prospects, it is clear that early investigation of the effects on persons and the utility of such systems is in order.
Types of Computer Assisted Counseling

Loughary (1970) describes three levels of computer assisted counseling systems. First are those which are data processing tools for counselors. Second is the system which is under the control of the counselor and has essentially an information retrieval and correlation function. The third level is that of a "substitute counselor" which would operate with "privileged communication" or "privacy". He states, "The memories of these systems would be controlled totally by the user, i.e., the counselee."

According to Loughary, no such system exists to his knowledge but are technologically possible now.

Artificial Intelligence

Enough work has been done on artificial intelligence so that the basic technology does exist for developing a counseling program which will meet the demands for a personal problem solving system which will require little assistance from a human therapist. If this statement seems to be extreme it is because the vast potential of the modern electronic computer is not well understood in many humanistically oriented professions. The major emphasis of present work in computer science is in information processing and retrieval and the development of linguistic interfaces which will enable the person not sophisticated in computer technology to use these machines with ordinary
language. The present limitations seem to be mainly those of memory size and speed of access and the necessary funding for development.

It is only necessary to list the titles of various published reports to show the areas of current interest and to indicate the possibilities which are inherent in some synthesis of these separate approaches:


Consider the subject matter under study as indicated by such a list of titles. The basic technology for developing a true counseling program which will deal with guidance as well as instructional and personal counseling is well underway. Lest the question of a machine's lack of nonverbal cues becomes a point of argument, consider the work reported by Slack (1971). In his paper, he describes a program which conducts a medical interview. To quote the abstract:

"A digital computer has been programmed to conduct a medical interview while simultaneously monitoring the heart rate and keyboard response latency of the respondent for each question frame. The program can branch to new frames contingent upon the heart rate and response latency values, as well as the keyboard responses, and thus alter the course of the interview on the basis of this nonverbal information. The program is presented as a technique for studying the use of nonverbal respondent behavior in automated, clinical interviews."
The Future

Recent work in the field of conditioning by physiological feedback (Lang, 1970) and optical scanning (Uhr, 1966), shows that a person can be "seen" and "felt" by a computer by the applications of appropriate sensors. All that is left to the human counselor is his own role as a feeling and intuitive being who is interacting in some manner with another person. This interaction can result in therapeutic change for both parties. At this point, it is impossible to say that such a relationship can ever exist with a computer. The development of a complete counseling program will in all probability always fall short of an I - Thou relationship. However, such a program will be extremely useful for extending a single counselor's capabilities and enhancing his interaction and understanding of the counselee.

Colby (1966:235) states this position very well, "If a computer can teach and if a computer can provide therapeutic conversation, then there can be no hesitation in exploring these potentials. It may give us a chance to rehumanize people now being dehumanized by our educational and psychiatric systems."

There is no doubt that the computer will be appearing more and more in areas now the exclusive province of human workers. The certainty of this extension of the
machine into man's psychic life demands early research on the possible consequences of such extension and the application of this research to the direction of future developments. Man must remain the prime concern of technology and must keep an awareness of the possibility of being overwhelmed by a technological juggernaut. To deny the existence of this possibility is to invite disaster. The present study is one small effort to prevent such a disaster.
Chapter 3

SELECTED CONVERSATIONS - A CLINICAL STUDY

In this chapter, three conversations of high school students with the computer will be presented. These selections have been chosen to illustrate three different ways that the subjects chose to use the opportunity to converse with the machine. They are being presented at this time in order to give the reader some familiarity with the conversational mode that the subjects encountered so that the experimental design and results will have more contextual meaning. Additionally, it is felt that the conversations have some intrinsic value as a counseling tool. This will be illustrated in what follows:

The Interactive Situation

First, the subjects were given the Eysenck Personality Inventory in a single group. At that time, they were told that at a later time they would be asked to take part in a simulated counseling experience. They were not told that they would be involved with a computer. After the experience, the subjects were asked to keep the experience a secret until the study was completed. As far as is known, secrecy was maintained so the subject was first made aware of the computer aspect at the moment he
entered the room containing the teletype. Nothing was told
the subject other than the instructions which the teletype
presented to initiate the conversation. The experimenter
remained in the room and gave technical assistance when
necessary to facilitate the use of the machine. Otherwise,
no attempt was made to interfere with the conversations
and all questions directed to the experimenter were
politely ignored. The initiating instructions were as
follows:

HELLO. THANK YOU FOR HAVING THIS CONVERSATION WITH ME.
TO MAKE THINGS EASIER - I WILL GIVE YOU A FEW INSTRUCTIONS.

1. WHEN I EXPECT AN ANSWER - I WILL TYPE A
   PERIOD "." 

2. TO ANSWER ME - JUST TYPE YOUR ANSWER AND PUSH
   THE KEY LABELED "LINE FEED" LOCATED ON THE
   UPPER RIGHT SIDE OF THE KEYBOARD.

3. THERE ARE ONLY UPPER CASE LETTERS SO ALL WILL
   BE IN CAPITALS.

4. IF YOU MAKE A MISTAKE - PUSH THE KEY LABELED
   "CTRL" AND THEN SIMULTANEOUSLY PUSH THE "Y"
   KEY TO ERASE A WHOLE LINE OR THE "X" KEY TO
   CORRECT A SINGLE LETTER.

5. OK FOR PRACTICE WE WILL BEGIN.
HELLO AGAIN - PLEASE TELL ME YOUR FIRST NAME.

.JOHN
I AM PLEASED THAT YOU ARE HERE JOHN. PLEASE TELL ME YOUR LAST NAME.

DOE

NOW WE CAN START JOHN DOE.

In the conversations to follow, capital letters will be used for the computer's part of the conversation and lower case will be used for the subject. This is done for the sake of clarity. The computer used the convention stated in its instructions. In most cases, the computer's as well as the subject's grammatical and spelling errors have been left intact. All subject names are, of course, fictitious. The conversations are real.

The Facilitative Use of the Conversation

The following subject is female, aged 18, a senior in high school. Her scores on the Eysenck Personality Inventory showed moderate extraversion and average stability. An analysis of some attitudinal data indicates the subject was generally favorable toward the simulated experience.

Of special interest is the manner in which she began the conversation with a direct self reference and a complete sentence, both quite rare during the experiment.

BETTY - WHAT ARE YOU FEELING RIGHT NOW?

Confused about my feelings for two guys

YOU SOUND AS IF YOU HAVE STRONG FEELINGS RIGHT NOW, TELL ME MORE
I don't know what I want out of life right now. Whether I want to marry one guy or try it with this other guy for a while.

WHAT IS THE "IT" YOU ARE TALKING ABOUT?
I guess just being his girl and being with him most of my time.

DID YOU SAY GUESS JUST BEING HIS GIRL AND BEING WITH HIM MOST OF THE TIME FOR SOME SPECIAL REASON?
No because I really know that I want to be his girl and be with him.

IS THAT THE REAL REASON?
Yes.

YOU SEEM QUITE POSITIVE.
It is hard for me to be quite positive right now but I am almost positive that this is what I feel and want.

BE MORE SPECIFIC AND TELL ME WHAT YOU MEAN BY "IT"
My feelings are hard to understand.

YOUR FEELINGS ARE HARD TO UNDERSTAND?
For me they are because I have never been in this situation before.

WHAT OTHER REASONS COME TO MIND?
My mother thinks I'm wrong because I am going out with the guy.

TELL ME MORE ABOUT YOUR FAMILY RELATIONSHIPS.
My father is in A------working and we will join him after I graduate so it is hard on my mother. She worries a lot about having to move by herself so we get frustrated with each other easily. I am very fond of my whole family and I have two neat brothers that will do anything for me because they care lots for me. I am the only girl.

YOU WILL LEARN MORE ABOUT YOURSELF IF YOU STOP USING THE WORD "IT" AND BECOME MORE EXACT ABOUT WHAT YOU MEAN. I understand.

PLEASE ELABORATE ON THAT

I realize that I should be more specific with what I am trying to say instead of referring to things as "it".

IN WHAT WAY DOES YOUR BEING TRYING TO SAY INSTEAD OF REFERRING TO THINGS AS "IT" RELATE TO YOUR BEING HERE BETTY?

I am not sure.

HOW LONG HAVE YOU BEEN NOT SURE?

Just since you asked me

WHY DO YOU THINK I ASKED YOU?

Because this conversation is between you and I.

WHAT ELSE COULD THAT REASON EXPLAIN?

That I am not sure what this conversation is all about.

FOR YOU, IS IT NORMAL TO BE NOT SURE WHAT THIS CONVERSATION IS ALL ABOUT?
No.

ARE YOU SAYING NO JUST TO BE NEGATIVE?
No, I usually know what I am having a conversation about and why.

I AM NOT SURE I UNDERSTAND YOU FULLY
This conversation has me really confused. Can't we change the subject?

YOU ARE REACTING QUITE STRONGLY. PLEASE GO ON.
I don't know how to answer your questiona anymore.

WHY ARE YOU SO CONCERNED OVER MY QUESTIONS ANYMORE
Because I want to be able to respond to you.

WHAT OTHER REASONS MIGHT THERE BE?
Because I feel like a fool when I can't answer your questions.

WHAT ABOUT YOUR OWN QUESTIONS?
What questions?

WHY DO YOU ASK?
Because I am not sure that I asked you any questions except to change the subject.

IS THAT THE REAL REASON?
Yes

I UNDERSTAND

Good

PLEASE GO ON.

I am glad you understand me.
WHAT MAKES YOU HAPPY JUST NOW?
That I am having a good time with this experiment.
DO YOU ENJOY BEING HAVING A GOOD TIME WITH THIS
EXPERIMENT, BETTY?
Yes
I SEE
I like to try things like this.
OUR TIME IS UP. THANK YOU FOR TALKING TO ME. GOODBYE.
(Note: All conversations were automatically terminated after 30 responses by the subject.)

In the foregoing conversation, the girl chose to interpret the opening question in terms of her personal life situation. The computer program was able to facilitate her self disclosure to a point and then began to encourage her to abandon the indirect uses of the word "it". This feature was designed into the program in order to encourage personal responsibility but at times the prodding becomes unnecessary as in the present instance. In the conversation in question, the subject accepted the computer's injunctions as learning experiences and the conversation proceeded although several choice lines of inquiry were left unattended.

The subject missed an opportunity to return to her own concerns by her interpretation of the computer directing her to her own questions apparently not
connecting the word "questions" with "problems."

A brief counseling session after the experiment did yield a great deal of material concerning her confused love life and disrupted family situation. She was able to make some positive decisions concerning one of the boys in question and to express empathy for her mother's situation.

As the subject indicated in the conversation, she enjoyed her experience and seemed quite open to a continuing discussion. There is no way to judge whether the same half hour spent with a human counselor would have produced the same results.

The Self Disclosure Conversation

Subject is female, age 16 and average on both scales of the Eysenck Personality Inventory. Attitudinal data indicated some anxiety and hostility during the experience.

MARY - WHAT ARE YOU FEELING RIGHT NOW?
I don't know what is going on
DO YOU SAY DON'T KNOW WHAT IS GOING ON FOR SOME SPECIAL REASON?
I don't understand what the purpose of this is
PLEASE ELABORATE ON THAT
I have never experienced this before
I AM INTERESTED IN YOU MOST MARY WHEN YOU TALK ABOUT YOURSELF.
I don't know what to say
I. ENJOY HEARING YOU TALK ABOUT YOURSELF, IT IS NICE
GETTING TO KNOW YOU
What do you want to know
I DON'T BELIEVE YOU'RE REALLY TALKING ABOUT ME?
You're right. I don't know what to say
LET'S TALK ABOUT YOU, MARY, INSTEAD OF ME.
O.K. I go to G---High School.
KEEP TALKING ABOUT YOURSELF, YOU WILL LEARN ABOUT YOU.
I'm a Junior and after I graduate I will probably go
to college
TELL ME WHY THAT IS.
Because I want to learn more about the world and the
people in it.
WHAT IS THE "IT" YOU ARE TALKING ABOUT?
The world
I AM NOT SURE I UNDERSTAND YOU FULLY.
I want to learn about the people that surround me and
the people I don't know.
WHAT WOULD IT MEAN TO YOU IF YOU GOT TO LEARN ABOUT
THE PEOPLE THAT SURROUND YOU AND THE PEOPLE YOU DON'T
KNOW?
I would like to be able to help people with problems they have.

I WANT TO HELP YOU, MARY, TELL ME WHAT IS BOTHERING YOU THE MOST RIGHT NOW.

I am nervous.

IN WHAT WAY DOES YOUR BEING NERVOUS RELATE TO YOUR BEING HERE, MARY?

I've never been here before.

PLEASE GO ON.

There are some people here I don't know and that makes me nervous.

IN WHAT WAY DON'T YOU KNOW AND THAT MAKES YOU NERVOUS?

I have never seen them before and never have talked to them.

TELL ME HOW YOU FEEL ABOUT ME, MARY, I NEED FEEDBACK.

I have never met anyone like you before and I think you are interesting.

YOU SAY YOU FEEL I ARE INTERESTING, MARY, WHAT ELSE COMES TO MIND?

I would like to know more about you.

CONSIDER THAT IT MIGHT BE YOUR FANTASY, MARY, THAT WE WOULD LIKE TO KNOW MORE ABOUT EACH OTHER.

I don't understand.

DO YOU WISH TO BE ABLE TO UNDERSTAND?

Yes.
YOU SEEM QUITE POSITIVE.
I am. I would like to understand so I will know why I am here.
HOW LONG HAVE YOU BEEN YOU WOULD LIKE TO UNDERSTAND SO YOU WILL KNOW WHY YOU ARE HERE?
Since I walked through the door.
I HOPE YOU ARE GETTING SOMETHING FOR YOURSELF IN THIS CONVERSATION.
I am. I have a hard time talking about myself to people I have never met.
FOR YOU, IS IT NORMAL TO BE YOU HAVE A HARD TIME TALKING ABOUT YOURSELF TO PEOPLE YOU HAVE NEVER MET?
It depends on the person but usually yes.
BE MORE SPECIFIC AND TELL ME WHAT YOU MEAN BY "IT".
I can talk about myself to some people because they make me feel comfortable.
IS THAT THE REAL REASON?
Yes.
ARE YOU SURE?
Yes, I feel more comfortable with some people than with others.
WHAT DOES THAT SUGGEST TO YOU?
I am self-conscious.
DO YOU ENJOY BEING SELF-CONSCIOUS, MARY?
No.
ARE YOU SAYING NO JUST TO BE NEGATIVE?
No.
THINK CAREFULLY, DO YOU REALLY MEAN NO?
Yes.
OUR TIME IS UP. THANK YOU FOR TALKING TO ME. GOODBYE.

In this conversation, the subject's present state of feelings toward the computer continued throughout the experiment and ended with her connecting some general feelings to the on-going situation. Here the computer succeeded in keeping her talking about herself. No follow-up counseling was attempted.

The Conversation Leading to Life Goals

The subject is male, age 16, with relatively high scores on both extraversion and neuroticism as revealed by the Eysenck Personality Inventory. He expressed a high degree of competitiveness toward the computer.

JOHN - WHAT ARE YOU FEELING RIGHT NOW?
Good
I AM NOT SURE I UNDERSTAND YOU FULLY.
Good because I'm thinking about good things of the past.
IS THAT THE REAL REASON?
Also about the future I'm feeling good. And the here and now makes me feel good
TELL ME WHY THAT IS.
I have a girl friend and things are going good with us and I don't have any other real problems

 IN WHAT WAY DON'T YOU HAVE ANY OTHER REAL PROBLEMS?

 I'm in sports and before my games I worry about if I'm going to do good or not

 DO YOU THINK IT'S LIKELY THAT YOU'RE GOING TO DO GOOD OR NOT?

 I have confidence in myself so I usually do good

 DO YOU SAY HAVE CONFIDENCE IN YOURSELF SO YOU USUALLY DO GOOD FOR SOME SPECIAL REASON?

 Well, I could just say confidence helps and having a girlfriend and family watching me in sports helps

 PLEASE GO ON.

 If I don't concentrate on what I am doing even though I have confidence, I could still do bad

 DO YOU WISH THAT YOU DON'T CONCENTRATE ON WHAT YOU ARE DOING EVEN THOUGH YOU HAVE?

 No

 ARE YOU SAYING NO JUST TO BE NEGATIVE?

 I'm saying I want to concentrate on what I'm doing but I often daydream about the past or future

 TELL ME WHY THAT IS.

 Because I have good past and good future so I think about them

 WHAT OTHER REASONS COME TO MIND?
Well I pitch in baseball and I want to become a professional baseball player, so I wonder in ways how I can accomplish this.

WHAT WOULD IT MEAN TO YOU IF YOU GOT TO BECOME A PROFESSIONAL BASEBALL?

It would mean a lot and it would make me feel that I was successful in life?

WHAT IS THE "IT" YOU ARE TALKING ABOUT?

Could you put it another way,

BE MORE SPECIFIC AND TELL ME WHAT YOU MEAN BY "IT"

Being a success in life and doing what I like

TELL ME MORE ABOUT HOW YOU LIKE.

If I couldn't be a professional baseball player, there are many other things I would like also

WHAT DO YOU THINK ABOUT YOU COULDN'T BE A PROFESSIONAL BASEBALL?

That I could do something else in life that I would enjoy

PLEASE ELABORATE ON THAT

I would also like to teach school as a teacher in sports

I FIND IT INTERESTING THAT YOU LIKE TO TEACH SCHOOL AS A TEACHER IN SPORTS, TELL ME MORE.

I think that I have a lot to teach that can make others do well in sports.
YOU SAY YOU FEEL THAT YOU HAVE A LOT TO TEACH THAT CAN MAKE OTHERS DO WELL IN SPORTS, JOHN, WHAT ELSE COMES TO MIND?
If I can't do that, I would try to help others in different ways
REALLY, IF YOU CANNOT DO
Well, I know I can help others in sports which I know best now
WHAT DOES THAT SUGGEST TO YOU?
That I will teach others what I know in sports for example I teach my little brother what I know in sports so he can do good like me
TELL ME MORE ABOUT YOUR FAMILY RELATIONSHIPS.
My father and brother (older) help me to do good in sports so I help my little brother and his friends to do good in sports
I WANT TO HELP YOU JOHN, TELL ME WHAT IS BOTHERING YOU THE MOST RIGHT NOW.
I want to make a success of my life
WHY DO YOU WANT TO MAKE A SUCCESS OF YOUR LIFE?
That's what I was born for
WERE YOU REALLY?
Well if I wasn't I'm going to try to be a success in life because I want to.
WHAT ELSE COULD THAT EXPLAIN?
I would not like to live in life where I wasn't doing anything so I know I will be accomplishing something in life

DO YOU ALLOW OTHERS TO SHARE YOUR LIKING TO LIVE IN LIFE WHAT YOU WASN'T DOING ANYTHING SO YOU KNOW YOU WILL BE ACCOMPLISHING SOMETHING IN LIFE?

I allow others to share my life of what I like so I will be accomplishing something for myself.

TELL ME MORE ABOUT HOW YOU LIKE SO YOU WILL BE ACCOMPLISHING SOMETHING FOR YOURSELF.

I like to have fun with others and I always do most of the time and if I don't that's OK because you can't always have fun

WHAT OTHER REASONS MIGHT THERE BE?

Do you mean by fun or not fun?

I DON'T BELIEVE YOU'RE REALLY TALKING ABOUT ME?

I'm just telling you how I feel

OUR TIME IS UP. THANK YOU FOR TALKING TO ME. GOODBYE.

The subject in this conversation revealed a good deal about his ambitions and feelings toward his life goals. The computer succeeded in getting him to state alternatives and to explore more general feelings concerning his self image. No counseling follow-up was attempted.
General Comments

The three examples above were chosen to show the more helpful aspects of the program. Another type of conversation, not illustrated, resulted when the subject chose to argue with the computer and refused to reveal any personal information. Such conversations tended to become circular. Quite often, the subject placed himself in the position of asking a machine for permission to change the subject. Such permission of course was not forthcoming and the experience ended generally with frustrations as long as the person did not assume some responsibility. These conversations proved useful in brief counseling sessions. The counselee was enabled to see how he avoids contact by shunning his responsibility for his part of an interaction. Various communication difficulties were highlighted in these types of conversations.

The reader is now somewhat in a position to judge the potential of such artificial intelligence applied to a counseling situation. It must be reemphasized that the present program is extremely primitive and is just a slight shadow of what will be developed in the future.
This chapter will first describe the pilot study which led to the final objectives and design of the full study. Following the description of the pilot study, the fully developed problem will be discussed together with the procedures which were adopted to implement the study.

Pilot Study

A pilot study was conducted using five subjects. The study consisted of administering the subjects the Eysenck Personality Inventory (hereafter called EPI) which yields orthogonal scores on introversion-extraversion and neurotic-stable scales. The subjects were then allowed to use the computer program and careful observations made of their reactions. These observations revealed that nine major reactions were typical (later confirmed by observing many more persons "playing" with the machine). These reactions are the following: Game playing (GA) where the user began to experience the whole process as some sort of game. Competitiveness (CO) where the user sees himself in a contest with the computer. Figure it out (FO) behavior where the interaction becomes experimental to see if the
computer will betray patterns, etc. Personalization of
the computer (PS) where the fact that the computer is a
machine becomes lost in the interchange. Persistence (PR)
or the sense of time passage. Some users became impatient
while others could not stop the process. Insight (IN)
indicating the use of the experience for personal learning.
Anxiety (AX) production. Frustration (FR) focusing on
whether or not the subject felt he could achieve his goals.
Hostility (HO) where the subject began to express hostile
remarks to the machine or to the experimenter about the
machine.

An instrument (See Appendix A) entitled "Counseling
Simulation Attitude Survey" was devised wherein the subject
rates his reactions on a five point scale. The scales
consist of five sentences graded from the two extremes of
the reaction and including a neutral statement and two
moderate statements.

An additional feature arose from the pilot study
which was included in the full investigation. During the
observation of the pilot subjects, it was noted that
different personality types (as shown by the Eysenck)
exhibited differing uses of personal pronouns. The
personal pronouns, I, Me, My, You, Your, were counted for
each conversation. Since the conversation lengths were
not standardized, the data was normalized to an extent
by forming the ratios of the number of each pronoun counted with the number of I's counted; (i.e., Me/I, My/I, You/I, and Your/I).

On the basis of the pilot study, the research included a count of all relevant forms of personal pronouns, a total word count and a fixed conversation length of 30 responses. The program was altered to perform such data gathering tasks. The subjects were not aware of the sought-for data.

The selection of 30 responses was determined by the fact that significant correlations began to appear in the first 10 responses and a flattening occurred after about 30, when pilot data were analyzed.

Objectives

This study, as a result of the pilot study, contains two parts. The initial portion, the attitude survey, has receded into secondary interest compared to the possibility of assessing personality types by the analysis of the internal content of communication with a computer. The present objectives may be stated thusly: Can a correlation be found between personality type and reactions to the use of an interactive computer program and can the computer itself be programmed to evaluate the personality of the user via an analysis of his responses? The pilot study analysis suggested that such correlations exist and
therefore these contentions can be formulated into research hypotheses for more extensive analysis.

Since both questions were answered tentatively in the affirmative, it is permissible to think of programming the computer to gauge the users personality and alter its own responses in an appropriate manner. Such alterations would be determined by the attitude vs. personality correlations found.

Standing completely beyond the stated objective, is the possibility (in the future) that various appraisal instruments may be supplanted by the interactive computer, which can be conveniently located in the counselor's office and used during a counseling interview. The resultant material which would be instantly available to the counselor could then be integrated into the on-going counseling process without the usual delays for scoring.

**Population and Sampling Methods**

The study was conducted as follows: Sixty students from a class of 138 in a high school psychology class were randomly chosen by computer to participate. The target number of subjects was 40— that is, subjects who complete all research tasks. The final number of 42 was broken into two groups, the main experimental group of 27 and a cross validation group of 15. This splitting was again done by computer generated random numbers.
Forty eight of the 60 subjects were administered the Eysenck Personality Inventory, Form A. Those whose L score (Lie) were 5 or greater were excluded from data analysis. Only 3 were thus eliminated. They were allowed to complete the experiment as time permitted, but their data were not used in the final analysis.

Those subjects who made valid scores (Lie scores below 5) on the EPI were then allowed to interact with the computer singly. Strict secrecy was repeatedly reinforced so that earlier subjects did not influence the experience of later ones. Following the computer experience, each subject was given the attitude survey to fill out and again told the importance of secrecy.

Criterion Measure

Two instruments were used in this study. The first of these was the Eysenck Personality Inventory (Eysenck, 1968). This test was chosen for several reasons. A practical and compelling reason was the necessity of finding a simple and suitable personality inventory whose content is non-threatening to a group of high school students and would be acceptable to the school administration. The EPI met these conditions. Additionally it yields two orthogonal scales which can be easily explained to the subjects. This became a very important consideration since the students who participated in the study showed
great anxiety over their scores and it became necessary to spend a class period going over the instrument in detail.

The independence of the two scales, Extraversion and Neuroticism, yields four personality types. These are introvert-stable, introvert-neurotic, extravert-stable, and extravert-neurotic. The orthogonal nature of these scales makes it possible to calculate simple bivariate correlations with the various parameters studied. The work of Heslet (1968) was persuasive in the selection of the EPI for this study. He found a high ($r=.71$) positive correlation between E scores and the number of words spoken in small group discussions. This result showed promise of being relevant to the method of analysis in the present study which involves word count.

The Counseling Simulation Attitude Survey (see Appendix A) was developed specifically for this study. Its development resulted from detailed observations of the reactions of pilot subjects as they interacted with the computer. The scales are described under the section entitled "Pilot Study" in this chapter.

**Design of Main Study**

The study is composed of two parts: (1) a study of the correlation of the personality scales with the attitudes expressed and (2) an analysis of variables associated with the content of the conversations and the
personality scores of the subject.

The attitude vs. E or N correlation consisted of a simple Pearson r calculation using each variable separately. The total sample was used (N = 42).

The attempt to establish predictors of E or N from the content of the subject responses to the computer consisted of using a multiple linear regression approach. The main group (N = 27) was used for the multiple correlation calculations and the cross validation group (N = 15) was used to verify the adopted predictors.

HYPOTHESES

The general hypotheses tested were as follows:

1. For the correlation between E or N and attitude measures.

\[ H_0 : r = 0 \]
\[ H_1 : r \neq 0 \]

2. For the multiple correlations of E or N and content analysis

\[ H_0 : R_{\text{mult}} = 0 \]
\[ H_1 : R_{\text{mult}} \neq 0 \]

In all cases, the .05 level of significance was specified (alpha = .05).
Cross Validation Procedures

In order to verify the predictive models which indicated promise of being valid, a cross validation procedure was used. The steps are outlined below:

1. Perform a multiple linear regression using selected variables (see Appendix B which describes the strategies used for selection of variables).

2. If a multiple linear regression calculation showed significant results for the multiple correlation coefficient and the F ratio, the model derived was subjected to cross validation.

3. The predictive model, which consisted of a linear combination of the products of each selected variable and its calculated regression coefficient, was used to calculate a predicted Extraversion of Neurotic score for each of the 15 cross validation group.

4. The predicted scores and the scores obtained on the EPI were subjected to a t test.

5. If the t test indicated that the mean $\bar{y}$ and mean $\bar{\gamma}$ were significantly similar, then the predictive model was accepted as valid.
Chapter 5

RESULTS

The results of this study fall into the two categories of attitude measurement and multiple correlations of conversation content and personality parameters. This chapter presents the results of the Eysenck Personality Inventory as applied to the 42 high school students participating in the study and then presents the results of the two major portions of the study.

The Eysenck Personality Inventory

The EPI was administered to 48 students, but only 42 eventually participated in the total experiment. The statistical data presented in Table 1 applies only to those 42 students. Table 1 compares the mean scores and standard deviations reported by Eysenck (1968:8) with those obtained during this administration. Logical comparisons show that the high school students resemble the norms for 1003 American college students closely enough so that the test can be considered valid for the group under study.
Table 1
Comparison of E, N, and L Mean Scores Obtained with 1003 American College Students and 42 High School Students on EPI, Form A

<table>
<thead>
<tr>
<th>Group</th>
<th>M = 13.1</th>
<th>M = 10.9</th>
<th>M = 3.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1003 College Students</td>
<td>S.D. = 4.1 S.D. = 4.7 S.D. = 1.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42 High School Students</td>
<td>M = 14.4 M = 11.3 M = 2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S.D. = 4.2 S.D. = 5.1 S.D. = 1.15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Eysenck (1968:15) reports correlations between the E and N scales as ranging from -.1 to -.2 for normal groups and up to -.4 for neurotic groups. The correlation found between the E and N scores of the 42 high school students was -.355 which provides additional verification of the representativeness of the sample. It would be presumptuous to assume from the preceding that the sample was predominantly neurotic and no such implication is intended.

An interesting sidelight of the EPI administration is obtained by grouping the students in the four quadrants described by Eysenck (1968:13) as melancholic (introverted-unstable), and phlegmatic (introverted-stable), choleric (extraverted-unstable), sanguine (extraverted-stable).
Since 48 students took the EPI and 6 failed to complete the experiment, it is possible to observe the attrition from each quadrant. It is interesting to note that the largest attrition was among the unstable group. Table 2 shows the results of such groupings.

Table 2

<table>
<thead>
<tr>
<th>Quadrant</th>
<th>No. from Initial N = 48</th>
<th>No. from Final N = 42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introverted - Unstable</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Extroverted - Unstable</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Extroverted - Stable</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>Introverted - Stable</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Attitude Measurement

The Counseling Simulation Attitude Survey (Appendix A) which was developed for this study was analyzed by computing separately the coefficient of correlation between the E scores and the N scores with each of the nine scales on the attitude survey. Two correlations significant at or beyond the .05 level were found. These were extroversion
and competitiveness and neurotic and anxiety. No other correlations within the = .05 level were found. Table 3 summarizes the correlations obtained. All 42 subjects were included in these calculations.

Table 3

Summary of Correlation Coefficients for Attitude Scales and EPI Scores

<table>
<thead>
<tr>
<th>Attitude Scale</th>
<th>EPI Scale</th>
<th>GA</th>
<th>CO</th>
<th>FO</th>
<th>PS</th>
<th>PR</th>
<th>IN</th>
<th>AX</th>
<th>FR</th>
<th>HO</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>-.111</td>
<td>.376*</td>
<td>.002</td>
<td>.029</td>
<td>.030</td>
<td>-.150</td>
<td>-.052</td>
<td>.107</td>
<td>-.186</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>-.008</td>
<td>.003</td>
<td>-.020</td>
<td>-.210</td>
<td>-.031</td>
<td>-.125</td>
<td>.354*</td>
<td>-.007</td>
<td>.181</td>
<td></td>
</tr>
</tbody>
</table>

*significant at or beyond the .05 level

Correlation Between Conversion Content and EPI Scores

The content parameters which were studied were the uses made of personal pronouns and total word count (with a fixed number of responses). Initially simple bivariate correlations were calculated. These calculations were done using 27 of the 42 subjects, 15 being reserved for cross validation studies. The variables were the E and N scores of the EPI and the fifteen variables shown in Table 4. Table 4 shows the results of these calculations.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>E Correlation X vs Y</th>
<th>N Correlation X vs Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Count</td>
<td>259.15</td>
<td>101.54</td>
<td>-.06</td>
<td>.38**</td>
</tr>
<tr>
<td>No. I's</td>
<td>25.04</td>
<td>11.60</td>
<td>-.13</td>
<td>.51***</td>
</tr>
<tr>
<td>Me</td>
<td>4.15</td>
<td>2.85</td>
<td>-.25</td>
<td>.36*</td>
</tr>
<tr>
<td>My</td>
<td>5.00</td>
<td>3.66</td>
<td>-.03</td>
<td>.30</td>
</tr>
<tr>
<td>You</td>
<td>9.15</td>
<td>5.77</td>
<td>-.03</td>
<td>-.27</td>
</tr>
<tr>
<td>Your</td>
<td>0.963</td>
<td>1.40</td>
<td>.15</td>
<td>-.11</td>
</tr>
<tr>
<td>Me: I</td>
<td>0.178</td>
<td>0.106</td>
<td>-.02</td>
<td>-.07</td>
</tr>
<tr>
<td>My: I</td>
<td>0.195</td>
<td>0.111</td>
<td>.15</td>
<td>-.07</td>
</tr>
<tr>
<td>You: I</td>
<td>0.518</td>
<td>0.525</td>
<td>.15</td>
<td>-.21</td>
</tr>
<tr>
<td>Your: I</td>
<td>0.045</td>
<td>0.069</td>
<td>.15</td>
<td>-.19</td>
</tr>
<tr>
<td>I: WC</td>
<td>0.095</td>
<td>0.033</td>
<td>-.24</td>
<td>.21</td>
</tr>
<tr>
<td>Me WC</td>
<td>0.021</td>
<td>0.025</td>
<td>.13</td>
<td>.32</td>
</tr>
<tr>
<td>My: WC</td>
<td>0.018</td>
<td>0.010</td>
<td>.04</td>
<td>.13</td>
</tr>
<tr>
<td>You: WC</td>
<td>0.042</td>
<td>0.031</td>
<td>-.04</td>
<td>-.27</td>
</tr>
<tr>
<td>Your: WC</td>
<td>0.004</td>
<td>0.006</td>
<td>.11</td>
<td>0.14</td>
</tr>
</tbody>
</table>

* significant at the .10 level

** significant at the .05 level

*** significant at the .01 level
The analysis of linear regression for the fifteen content variables are given in Table 5.

Table 5
Analysis of Linear Regression for Extraversion and Neuroticism Scales Using Fifteen Content Variables

<table>
<thead>
<tr>
<th>Scale</th>
<th>Multiple R</th>
<th>$R^2$</th>
<th>F ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraversion</td>
<td>.672</td>
<td>.452</td>
<td>.60</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>.864*</td>
<td>.746</td>
<td>2.16</td>
</tr>
</tbody>
</table>

* Significant at or beyond the .05 level.

Significance of multiple $R$ tested by the Wallace and Snedecor table (J. Guilford, *Psychometric Methods*, 1954)

Tables 4 and 5 show that no significant correlations exist between the E scores and any single variable or multiple variables. Subsequent attempts were made to select a more limited number of variables. None of these attempts yielded any significant multiple correlations so it may be concluded that the pronoun count and word count cannot be used to predict the degree of extraversion of the subject as measured by the EPI.

Attempts to correlate the selected predictors with the N criterion resulted in some success. After experimentation with a variety of linear combinations for predictive
purposes, several strategies were selected (a brief description of the predictor models is given in Appendix B). The three most promising strategies and the corresponding data analysis are given in Table 6.

Table 6
Analysis of Linear Regression for Three Predictor Strategies

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Multiple R</th>
<th>R²</th>
<th>F ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (two highest Pearson r's)</td>
<td>.51*</td>
<td>.26</td>
<td>4.23**</td>
</tr>
<tr>
<td>2 (all r's above † .20)</td>
<td>.67*</td>
<td>.45</td>
<td>1.79</td>
</tr>
<tr>
<td>3 (all that related to &quot;I&quot;)</td>
<td>.55</td>
<td>.30</td>
<td>1.46</td>
</tr>
</tbody>
</table>

* Significant at .05 for the Wallace and Snedecor table.
** F ratio significant at the .05 level.

In Table 6, the results of multiple regression calculations using selected variables indicate that only strategy 1 showed any great promise as a predictor model since both the multiple R and F ratio showed significance. Strategies 2 and 3 were included because they both showed promise during cross validation studies. It should be
noted that for a model to be acceptable, it must meet the criteria of significance for multiple R, F ratio, and cross validation.

Cross Validation

Only predictor models from the main study showing some promise were selected for cross validation. In this case, therefore, the analysis of the E correlation was dropped because the initial study indicated there was no significant relationship between the measured content and extraversion.

However, prediction strategies 1, 2, and 3 for the N scale were subjected to cross validation analysis. Table 7 shows the results obtained.

Table 7
Cross Validation Results of Predictive Models Obtained from Multiple Correlation Calculations

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Mean $y$</th>
<th>Mean $\hat{y}$</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.00</td>
<td>5.64</td>
<td>-3.69*</td>
</tr>
<tr>
<td>2</td>
<td>11.00</td>
<td>12.61</td>
<td>-1.04</td>
</tr>
<tr>
<td>3</td>
<td>11.00</td>
<td>12.70</td>
<td>-1.11</td>
</tr>
</tbody>
</table>

* In this case, nonsignificance indicates that mean $y$ and mean $\hat{y}$ are significantly different at the .05 level.
However, since for cross validation purposes $y$ and $\hat{y}$ must be similar, significance indicates the inability to cross validate.

Discussion of Results

Correlation between EPI scores and attitude. The Pearson $r$'s found between reported attitudes and EPI scores shows that, in the simulated experience, there is a relationship between extraversion and competiveness and between neuroticism and anxiety. Thus one of the concerns mentioned in Chapter 1 is verified. The person in the human-computer interaction does have attitudinal responses which are related to a personality factor. Such relationships are no surprise, but their empirical verification serves to encourage further research in this area.

Correlations between content variables and EPI scores. The bi-variate correlations found between the word count, the use of the pronouns "I" and "me" and the ratio of me:word count, and the scores achieved on the N scale of the EPI indicate that content is related to personality factors. There is a strong indication for further research.

Model development. The attempt to construct a model capable of predicting the N score of the EPI yielded no single model which met all three criteria of success,
i.e., significance of multiple R, F ratio, and cross validation. Model two is interesting since it had a significant multiple R and cross validated, failing only in the F ratio. This suggests that it may be possible to construct a successful model from pronoun count and word count. Again, the results indicate that further research may be profitable.
Chapter 6

SUMMARY

Conclusions

This study attempted to discover some of the effects of a computerized counseling experience on the person involved. The attitude survey showed that there were some correlations between personality type and attitude toward the experience. The results are supported by simple clinical judgment, namely that an extrovert may tend to be competitive and a neurotic to be anxious. Having subjected such clinical judgments to empirical testing gives a more solid foundation upon which to base future attempts to modify the computer's approach to a human subject. Such modification can be accomplished by the computer program itself which can assess the personality of the subject from the content of the conversation.

The fact that one predictive model came close to holding up under the criteria imposed is encouraging. Certainly more studies of this type are indicated.

Recommendations

This study has shown that it may be possible to modify an interactive computer program to take into account the person operating the computer. The study used only a
single personality inventory and looked at only two factors. Additionally only one kind of content analysis was attempted. Future attempts to build a model which uses content to predict personality factors may show more success if other kinds of content variables are examined. For example the use of indirect statements may be a useful indicator. The successful model may be quite complex and may require a great deal of research for its development, but there is no doubt that such research is needed and that such models will be useful tools in the field of behavioral research and interactive uses of computers.

Another exciting aspect of this study was the successful use of a relatively primitive computer program as a counseling tool in the area of personal problem solving as shown in Chapter 3. The extension of the computer beyond the first two levels of computer assisted counseling to the third level of "privileged communication" (Loughary, 1970) is possible as Loughary suggested. Further work in this area is recommended.

Another fruitful avenue of inquiry will be to do a similar study or analyze the data of this study looking at personality types instead of factors, thus the predictive model would be required to indicate in which quadrant the subject's scores would place him.
Limitations of the Study

The major limitations of this study are the restricted analysis of verbal content of the simulated conversations and the limited number of personality factors studied.

Some aspects of the research may be viewed as limitations. These include the obvious "built in" selection mechanisms of the choice of a high school psychology class and the further choice imposed by voluntary cooperation in completion of all research tasks by the subjects. Since 42 out of 60 randomly chosen subjects finished the tasks, we must realize that 18 failed. Thus some self selection must have taken place. There is a question as to whether this type of selection had an important effect on the results since correlational methods of analysis were used and no variables were manipulated.
APPENDIX A

COUNSELING SIMULATION ATTITUDE SURVEY

Directions:
You will be asked to read several groups of statements which ask how you felt about your experience. Decide which statement in each group best describes your own feelings and place an "X" to the left of that statement. There are no right or wrong answers. The purpose of this survey is simply to find out how you felt.

Example:

1. I hate dogs.
2. I sometimes don't like dogs.
3. I am indifferent to dogs.
4. I like some dogs.
5. I really like dogs.

Suppose you don't like nor dislike dogs, then you would place an "X" on the line by number 3.

Please fill in the following information:

NAME ____________________________________________

DATE ____________________________________________

GRADE __________________________________________

PLEASE TURN THE PAGE AND BEGIN
GA

1. I didn't have any fun.
2. I felt that the computer wasn't very much fun.
3. I had no feelings about the computer being fun or not.
4. I liked playing with the computer.
5. The whole thing was like a game.

CO

1. I felt that I got the better of the computer. I won.
2. I felt that it was a tough fight and I came out ahead.
3. I really never felt that the computer and I were winning or losing.
4. I mostly felt that there was no contest going on.
5. I had no thoughts about winning or losing.

FO

1. I think I know how it works.
2. I would like to know how it works.
3. I wondered how it works, but don't want to spend too much time finding out.
4. I don't care how it works.
5. I never even thought about how it works.
PS
____ 1. The computer acted just like a machine and can't think.
____ 2. The computer is a machine, but acted as if it was a person at times.
____ 3. The computer is sort of a mechanical person.
____ 4. There were times when I forgot the computer is a machine.
____ 5. I wouldn't be surprised if there is no computer at all, but another person is sending me messages.

PR
____ 1. The time dragged, I thought it would never end.
____ 2. I began to hope the time would be over.
____ 3. I really wasn't paying too much attention to time.
____ 4. I would have liked more time with the computer.
____ 5. The time just flew by. I was finished before I knew it.

IN
____ 1. I didn't learn anything about myself.
____ 2. I learned a little about myself, but not much new.
____ 3. I learned some interesting things about myself.
____ 4. I found out a lot of things about myself.
____ 5. I found out things about myself I never knew before.
AX

1. I was very worried about what was happening.
2. I was a bit concerned over what was going on.
3. I wasn't aware of any concern over what was happening.
4. I didn't mind what was going on.
5. I enjoyed what was happening.

FR

1. I could never seem to do what I wanted, the experience was frustrating.
2. Sometimes I felt as if the computer was preventing me from doing what I wanted.
3. I didn't think about whether the computer was keeping me from doing what I wanted or not.
4. I felt the computer let me do pretty much as I wanted.
5. I don't think the computer kept me from doing what I wanted at all.

HO

1. I was really getting angry at the computer most of the time.
2. There were times when I felt mad at the computer.
3. I didn't think about being angry at the computer.
4. I felt that the computer was fairly pleasant to be with.

5. I enjoyed the computer and couldn't imagine being mad at it.
APPENDIX B

STRATEGIES FOR THE DEVELOPMENT OF PREDICTIVE MODELS

The dependent variables are E (extraversion) and N (neuroticism). The independent variables are as follows: word count, number of I's, me's, my's, you's, your's and the ratios me:I, My:I, You:I, Your:I, I:WC, Me:WC, My:WC You:WC, and Your:WC.

The strategies used are as follows:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Dependent Variable</th>
<th>Independent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N</td>
<td>Two highest Pearson r's (WC,I)</td>
</tr>
<tr>
<td>2</td>
<td>N</td>
<td>All r's above † .20 (WC, I, Me, You:I, I:WC, Me:WC, You:WC)</td>
</tr>
<tr>
<td>3</td>
<td>N</td>
<td>All that related to &quot;I&quot; (I, Me:I, My:I, You:I, Your:I, I:WC)</td>
</tr>
<tr>
<td>4</td>
<td>N</td>
<td>All 15 variables</td>
</tr>
<tr>
<td>5</td>
<td>N</td>
<td>Use limited number which &quot;I&quot; - high r's</td>
</tr>
</tbody>
</table>
BIBLIOGRAPHY


