AN EXAMINATION OF THE VALIDITY OF THE PROGRAM EVALUATION ANALYSIS COMPUTER AS AN EVALUATION INSTRUMENT FOR INSTRUCTIONAL AND INFORMATIONAL PROGRAMS

CYRIL PAUL NOSEWORTHY

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by

© CYRIL PAUL NOSEWORTHY, B.A., B.Sc.

A Thesis submitted in partial fulfillment of the
requirements for the degree of
Master of Education

Division of Learning Resources
Memorial University of Newfoundland

1983

St. John's Newfoundland

Abstract

Recent research indicates a widespread use of new electronic evaluation instruments in the study of media presentation. One such electronic technique is the Program Evaluation Analysis Computer (PEAC). Research has been conducted using such instruments without the necessary preliminary work being conducted to determine their compatability with more traditional methods. To ascertain the effect of the PEAC system, the present study was conducted to investigate its effect upon achievement and attitude levels as compared to measures obtained through traditional measures. A pilot study and two studies using two different types of subject matter (instructional and informational) were used. A total of 370 *Ss* were used in these studies.

The results indicated that the use of the PEAC system did not affect viewers' achievement level and that *Ss* perceived one evaluation method as effective as the other. However, it was found that use of the PEAC system to evaluate a presentation does effect the perception and evaluation of what is being viewed. It was found, using factor analysis, that *Ss* evaluated the presentation on different dimensions depending upon what evaluation instrument they employed, i.e. the PEAC system or the more traditional rating scales. Also, the dimensions evaluated varied according to sex.

ACKNOWLEDGEMENTS

Perhaps the hardest task of graduate work is trying to express one's gratitude to all those who shared in the process. Graduate School is a very special place and I thank Dean Frederick Aldrich and Dr. Garfield Fizzard for their enduring encouragement and support. Dr. Richard Braffet served as my major professor and I thank him for making my years in graduate school a pleasant and rewarding learning experience.

I gratefully acknowledge and will always treasure the friendship and assistance given to me by the staff of the Division of Learning Resources. A special thank you to my old colleagues in the Psychology Department - Jr. Division for their generous support and cooperation in allowing me into their classrooms. Mr. Richard Maddigan must be singled out, not only for being a long time friend and fellow researcher, who introduced me into the world of classroom testing but for also allowing me to use and evaluate his program "Introduction to Memory". Such confidence in bearing one's professional ability to scrutiny can only be reflected in the quality of his professionalism and his ability.

I would also like to thank ETV, producers of the program, for granting their permission to use it, and the Institute for Research in Human Abilities (I.R.H.A.) for allowing me to use their Program Evaluation Analysis Computer (PEAC). To my long time colleague, Joan Sharpe, a special thanks for her assistance in data collection.

A very special thank you must go to Dr. A.M. Sullivan who

gave me my first job as a research assistant in 1974 and with whom I am still 'quite consistently' affiliated.

Words or deeds cannot express my gratitude to my sister, Dr. Cathryn Noseworthy-Button who was my guiding light throughout this process and who was invaluable in helping me verbalize many difficult concepts. Thanks must go to her as well for major assistance in editing this manuscript. Her efforts add new dimensions to the meaning of family.

I must share the fruits of my labour with my wife, Marie Sharpe, whose love, tolerance and encouragement enabled me to persevere and complete the graduate program. Finally, credit must also go to my new darling daughter, Victoria, who accelerated the completion of this manuscript so that her father's den could be converted to a nursery. May the ambience of intellectual pursuit and self-fulfillment linger there for many years.

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INTRODUCTION

The introduction of new electronic evaluation instruments with widespread applications has led to extensive use of such instruments without empirical examination of the validity of the instruments themselves. Research has demonstrated that the more traditional evaluation instruments in use today have gone through long but necessary preliminary study to determine their validity and their effectiveness in media applications in education. However, electronic evaluation instruments, such as the Program Evaluation Analysis Computer (PEAC), have been used without this necessary preliminary work being conducted. To partially correct this situation the present research was conducted to investigate the effect of the PEAC system upon achievement and attitude levels as compared with measures obtained through more traditional evaluation instruments using two different presentation formats - instructional and informational.

The effectiveness of media applications in education have been amply reviewed elsewhere. (Chu and Schramm, 1967; Dubin and Taveggia, 1968; Dubin and Hedley, 1969; Cambre, 1981; Campeau, 1974; Jamison et al., 1973; Moldstad, 1974; Barbatsis, 1978).

Since the beginning, the continuous striving to evaluate media innovations in education, as elsewhere, has led researchers to contrive ingenious methods of evaluation. Film appraisal checklists were developed as early as the 1930's and are still in use today (Devereux, 1933). Similar checklists were developed to serve as guidelines in the production of film instruction and, if followed, was all that was necessary to produce a presentation

(Brunstetter, 1935). A wide variety of paper and pencil tests, such as the Osgood Semantic Differential (Osgood, Suci, and Tannenbaum, 1957), and the Likert Rating Scale (Likert, 1932), have been consistently used to assess attitudes, interests, and preference for various media forms (Sullivan et al., 1976 and 1979; Duck and Baggaley, 1976).

However, the unique contribution of media researchers to evaluation techniques was in the development of electronic measurement devices. Initially, these devices were rather crude, but with the advances made in microtechnology, have become very sophisticated.

Clark (1932) developed a simple electronic distraction device which enabled him to observe wayward glances during the course of an audiovisual presentation. The device consisted of a bell or flashing light placed in locations away from the center of attention which was activated by the teacher with a push of a button. Students' reactions to the distraction device was photographed and an analysis of the photograph revealed the number of students looking away from the presentation. Although this research was not formative, it is quite similar to more recent devices used for formative evaluation purposes (Land, 1971).

Evaluation innovations of media were also prevalent in radio, which for years was used as the catalyst for marketing researchers to measure the effectiveness of their product using crude methods of audience analysis prior to it being aired. One such technique developed and cited by Coutant (1939) was called feature analysis of radio programs. Subjects were gathered together and asked to

rate various features in a program. The resulting data produced an appeal profile which was used to determine the changes to be made in the program before it was aired. Since the effectiveness of such a technique depended upon the list of single program features comprising the profile, Coutant suggested that it be preceded by a more formal experiment. This technique formed the basis for the development of the Program Analyzer and audience appeal profiles for the evaluation of radio and films during the 1940's and 1950's.

Cambre (1981) views the development of the Program Analyzer, in 1940 by Lazarsfeld and Stanton to evaluate radio programs, as the first major mechanical device to influence educational media evaluation. The analyzer was basically a polygraph machine that recorded audience responses at the touch of a button. The Program Analyzer and its later versions allowed for a simultaneous and continuous data collection of from ten to several hundred respondents during the course of one program. When used in conjunction with questionnaires and interviews, the device allowed producers to analyze audience reactions to their products on a second- to- second basis and to investigate characteristics as they might bear on those reactions. Mechanically collected data typically were generated in the form of a rating profile - a graphic representation of the continuous reactions of the audience to the program as it proceeded.

Sturmthal and Curtis (1944) employed the program analyzer to evaluate two films, moment-by-moment, using the scale like-dislike with approximately 200 subjects. The investigators also employed

self-administered questionnaires and interviews to supplement and verify their findings. They found that certain predictions could be made after analyzing only one-third of the script with this methodology.

The Program Analyzer, because of its efficiency and effectiveness as an evaluation instrument, received widespread use during the 1940's and 1950's. The Analyzer served as the basic blueprint for later models which were developed and modified to meet specific research and evaluation needs, such as the Cirlin Reactograph (Cirlin and Peterman, 1947) and the Film Analyzer (Carpenter, Eggleton, John, and Cannon, 1950).

The most widely known development and application of formative evaluation using the Program Analyzer has been the Children's Television Workshop (CTW). Mielke and Chen (1980) see their research at CTW as being concerned with the production of goal-directed television programs. The simple but powerful methodology of applying the results of feedback from the target audience to the development of the television program while still in its early stages of production has proven to be quite effective and fruitful. CTW's extensive research program over the past two decades has resulted in a number of refinements - the most significant of which has been the development of the Program Evaluation Analysis Computer (PEAC).

The PEAC system is the latest viewer response system developed jointly by CTW and the Ontario Educational Communications Authority (OECA). The system consists of wireless, battery-powered hand units similar to a calculator. Each

hand unit consists of a 16 button keyboard for viewers' responses. Responses are sampled as frequently as every quarter of a second enabling the viewer to log responses moment by moment during a program and to change his responses to it as frequently as he wishes. The responses, stored in the hand units during the program, are then transferred to an Apple II microcomputer at the end of the session and are stored and analysed on a magnetic diskette.

Chen (1978) has summarized four major advantages the PEAC system has over its predecessor - the Program Analyzer. The first is the convenience of a wireless hand unit for large-group testing. A second is the ability of the units to log responses to multiple-choice questions, removing the barrier of responding by paper and pencil. A third is the immediate feedback of results, made possible by the computing power of the Apple computer. The period from data collection to final response graph has been cut from thirty hours to fifteen minutes. A fourth advantage is the ability of the Apple to display results in color graphics on a TV monitor, in profiles, histograms, or other display formats. Such displays can be viewed in time to the actual test program. Producers can examine the response to each 10-second interval on one TV screen and the corresponding stimulus material played simultaneously on another. This feature of the PEAC system opens new opportunities for communicating research results in a language and format attractive to TV producers and writers. The system made it possible for research staff to both collect a wealth of useful data across a number of important questions and also to

meet the needs of producers for immediate results.

Another advantage of the PEAC system has been cited by Baggaley (1982) who has found that the system can be used to penetrate language and literacy barriers in research conducted on the seal hunt in rural Newfoundland.

The superiority of the PEAC system over previous electronic evaluation instruments has led to its extensive use and wide application (Nickerson, 1979, 1980, 1981; Spears and Gillis, 1981; Baggaley et al., 1982; Myrick and Keegan, 1981; Chen et al., 1979). For example, the system has been successfully employed in areas such as health education, advertising, political campaigning, social impact studies, program development, and the study of psychological and production variables in instructional and informational television.

The simplicity of operation, the immediacy of feedback of results and the colorful graphic representation characteristic of the PEAC system have so bedazzled the researcher and producer alike that the system has been uncritically accepted as a valid measuring instrument. The central assumption underlying research using the PEAC system is a direct parity between the results of electronic and traditional test instruments. Yet, despite the widespread application of electronic evaluation, this assumption has never been empirically examined.

Given the obvious and extensive differences between the PEAC system and traditional paper and pencil measures, e.g. PEAC is continuous and the latter evaluates after the fact), it would seem mandatory to examine the equivalence of the two types of

evaluation. Indeed, research has established a number of covert variables which affect viewer's perceptions and attitudes. For example, Sullivan et al. (1979) have found that the presence of an audience affects viewers' attitudes and learning; while Baggaley et al. (1980) have shown that camera angle, background, labels, etc. influence viewers' attitudes towards what they see. Therefore, it is probable that the PEAC system, per se, has an effect on viewers' assessments of how they feel about and what they learn from programming.

Unfortunately, although such studies have used the PEAC system in conjunction with other evaluation methods, none of these studies have examined the effect of the PEAC system on the evaluation process. In light of a recent research trend to replace traditional evaluation measures solely with the PEAC system, such examination of the measurement properties of the PEAC system is necessary.

The present research consisted of three studies. The first was a pilot study to determine the most appropriate scale to be used with the PEAC system. This scale was empirically selected from a Likert-type scale to determine the most representative scale measuring one of the dimensions i.e., expertise or credibility, etc. from that scale. This scale was then incorporated into Study 1, which was an examination of the effect of the PEAC system as compared to more traditional evaluation instruments in an instructional setting upon such variables as attitude and achievement level.

Study 2 replicated this design, omitting the achievement

test, using an informational program, to determine if the results obtained with an instructional format were comparable to those in a more consumer-oriented format and to increase the generality of the results.

PILOT STUDY

A pilot study was conducted in order to select the most appropriate scale from the attitude scale to be used with the PEAC system for each of the two subject matters, and to confirm the feasibility of the attitude scale in a classroom setting using two different presentation formats - instructional and informational.

Procedure

Subjects:

Subjects were seventy-two (72) college freshmen, thirty (30) males and forty-two (42) females with a mean age of eighteen (18). These Ss, comprising two classes, were randomly selected from the Introductory Psychology course. This course has an enrollment of approximately fifteen hundred (1500) students. One class (n=35) viewed the "Introduction to Memory" -the instructional videotape, while the second class (n=37) viewed the CTV National News - the informational videotape.

Instruments:

A Likert-type scale consisting of twenty-two (22), seven (7) point bipolar scales was used as a measure of subjects' attitudes towards the program (see Appendix A). Of the twenty-two scales used, twelve (12) were randomly selected to have their poles reversed and were then randomly distributed throughout the scale in order to counteract a response bias.

This scale has been used extensively by Duck and Baggaley (1976) and Baggaley, Ferguson, and Brooks (1980) in numerous studies using various subject matters and has been reported to produce quite consistent results by these authors. In addition, a

scale was included to evaluate the perceived effectiveness of this type of scale in conveying the subjects' attitudes towards the program and the age, sex, and grade eleven average (used as an ability measure) for each subject was also collected.

Programs:

Two videotaped programs to be used in the main studies were used in the present pilot study. The programs employed different presentation formats, the first program was an instructional presentation entitled "Introduction to Memory", and the second was an information program, the CTV National News.

Introduction to Memory:

The Psychology Department at Memorial University of Newfoundland in cooperation with the university's ETV Dept. have put the introductory Psychology course onto videotape and it is presently being aired on ETV cable channel 13 as an off-campus credit course. "Introduction to Memory" is one of the twenty-three programs which comprise this telecourse. This program is a twenty-eight minute color production which discusses levels of human memory (i.e. short term memory, long term memory, and sensory storage) and their characteristics and measures of retention. The complete script is included as Appendix B.

CTV National News:

The informational presentation was a ten (10) minute color videotaped excerpt of the CTV National news. The content of this excerpt consisted of items such as the Polish crisis - Solidarity, Egypt's crackdown on political opposition, Iran's assassinations, Canada's security service - RCMP, Canada's new fighter planes,

Canada'a economy, Stelco strikes, nuclear arms in Europe, all of which continued to be of current interest at the time Study II was conducted one week later. The complete script is included as Appendix C.

Hardware:

A standard Sony VO-2600 videocassette recorder connected to a Panasonic color television was used throughout all experimental sessions to view the programs under study.

Procedure:

The pilot study for the instructional presentation (Introduction to Memory) was introduced by the E to the class as follows:

"The Psychology Department in conjunction with ETV are putting this course - Introductory Psychology - onto videotape which will be aired on cable channel 13 this semester for those students who cannot come to the university. One of these videotapes is entitled "Introduction to Memory" which you will cover later this semester and which we will look at today. We would like your impressions of this program by completing a short attitude scale at the end of the program."

The E then turned on the videocassette recorder to commence the program. Upon completion of the program the E turned off the videocassette recorder and distributed the attitude scale with the following instructions:

"We would appreciate it if everyone would fill in their age, sex, and grade eleven average in the spaces provided at the top of the page. Below this there are instructions and an example to

show you how to fill in the scales. Please circle only one number per scale and please complete all scales. At the bottom of the page we would like you to indicate how effective you think this scale is in helping you evaluate this program. If you have any questions or problems in using the scale, please raise your hand and I will come to assist you."

Subjects were given 10 minutes to complete the attitude scale after which it was collected by the E. The class was then thanked for its cooperation and dismissed.

The same procedure was used for the class that received the informational program with the only variation being that of the introduction of the experiment. The introduction for the CTV National news was as follows:

"We, the Psychology Department, are interested in evaluating different television formats and the attitudes of viewers towards them. Today we will view a 10 minute segment of the CTV National news and we would like your impressions of this program by completing a short attitude scale at the end of the program."

RESULTS AND DISCUSSION

Prior to data analysis it was necessary to reverse scales such that polarity was in the same direction for all scales. The mean rating and standard deviation of each scale for *Ss* evaluating the instructional program are presented in Table 1 and for *Ss* evaluating the informational program in Table 2. Table 1 shows that *Ss* rated the program positively on all of the 22 scales, with the most positive being "Interesting" and "Good", both with a $\bar{X}$=2.23 which corresponds to a point on the rating scale between 2 (Quite Positive) and 3 (Moderately Positive). The most negative of the ratings was given for the scale "Superior" ($\bar{X}$= 3.57) which is a point located between 3 (Moderately Positive) and 4 (Can't Decide/Not Applicable).

For *Ss* rating the informational program, Table 2 shows that *Ss* rated the program the most positive in terms of the scale "Serious" ($\bar{X}$= 1.60) which corresponds to a point midway between 1 (Very Positive) and 2 (Quite Positive). The data shows that the range of $\bar{X}$ ratings was greater for this program, the scale "Gentle" ($\bar{X}$= 5.03) being rated as moderately negative.

Table 1. Means and Standard Deviations of the 22 attitude scales for the Instructional program.

SCALE +	N	$\bar{X}$	SD	SCALE -
SINCERE	34	3.03	1.27	INSINCERE
SUPERIOR	35	3.57	1.34	INFERIOR
CONFIDENT	35	2.66	1.35	UNSURE
SERIOUS	35	3.17	1.25	HUMOROUS
RELAXED	34	2.50	1.67	TENSE
STRONG	35	2.89	1.13	WEAK
PERSUASIVE	33	2.58	1.48	UNPERSUASIVE
PROFOUND	35	3.37	1.29	SHALLOW
INTERESTING	35	2.23	1.54	UNINTERESTING
DEPENDABLE	35	2.74	1.46	UNDEPENDABLE
CALM	35	2.66	1.35	AGITATED
HUMANE	34	2.44	1.16	RUTHLESS
WARM	35	2.80	0.93	COLD
INFORMED	35	2.40	1.67	UNINFORMED
GOOD	35	2.23	1.24	BAD
GENTLE	34	3.38	1.30	AGGRESSIVE
HONEST	35	2.23	1.50	DISHONEST
RELIABLE	34	2.44	1.42	UNRELIABLE
PLEASANT	35	2.83	1.71	UNPLEASANT
CAUTIOUS	35	3.40	1.03	RASH
FRIENDLY	34	2.38	1.50	UNFRIENDLY
NOT NERVOUS	34	3.18	1.90	NERVOUS

TABLE 2. Means and Standard Deviations of the 22 attitude scales for the Informational program.

SCALE +	N	$\bar{X}$	SD	SCALE -
SINCERE	36	3.11	1.26	INSINCERE
SUPERIOR	36	3.39	1.02	INFERIOR
CONFIDENT	37	2.92	1.62	UNSURE
SERIOUS	37	1.60	1.34	HUMOROUS
RELAXED	37	4.62	1.83	TENSE
STRONG	37	2.78	1.23	WEAK
PERSUASIVE	36	2.39	1.25	UNPERSUASIVE
PROFOUND	36	3.31	1.39	SHALLOW
INTERESTING	37	2.68	2.04	UNINTERESTING
DEPENDABLE	37	2.68	1.23	UNDEPENDABLE
CALM	37	3.92	1.71	AGITATED
HUMANE	37	3.97	1.68	RUTHLESS
WARM	36	4.86	1.46	COLD
INFORMED	37	2.14	1.46	UNINFORMED
GOOD	37	2.87	1.60	BAD
GENTLE	37	5.03	1.38	AGGRESSIVE
HONEST	37	2.38	1.04	DISHONEST
RELIABLE	37	2.62	1.48	UNRELIABLE
PLEASANT	37	4.51	1.79	UNPLEASANT
CAUTIOUS	37	4.03	1.42	RASH
FRIENDLY	37	3.97	1.74	UNFRIENDLY
NOT NERVOUS	37	3.70	1.66	NERVOUS

The data from the instructional and the informational programs were each submitted to a principal components analysis to examine the attitudinal dimensions evaluated in each of these formats.

Kaiser's rule (Kaiser, 1958) was used to extract factors that had eigenvalues greater than 1.00. Extracted factors were orthogonally rotated using the Varimax procedure (Child, 1978; Harman, 1967), and factor loadings of $\geq .55$ were considered meaningful for the purposes of factor definition.

The results of this analysis for the instructional program are presented in Table 3, which shows that seven (7) factors were extracted that accounted for 60% of the total variance. The scales that significantly defined each of these factors (i.e. loadings $\geq .55$) are also presented in Table 3. The full factor matrix, with associated eigenvalues and communalities, for this analysis is presented in Table 1, Appendix D.

The principal components analysis for the informational program yielded a quite different pattern of factors. Seven factors were extracted that accounted for 55% of the total variance, but, as can be seen in Table 4, the scales that significantly defined these factors were considerably different from the analysis for the instructional program. For example, factor 1 for the instructional program comprised only three (3) scales whereas factor 1 for the informational program had eight (8) scales loading on it, and could be considered a general evaluative factor. However, the factor pattern differences were not of primary concern in the pilot study, rather the study was

meant to find the strongest common scale across the two subject matters. The full factor matrix, with associated eigenvalues and communalities, for the informational program analysis is presented in Table 2, Appendix D.

As noted previously, the purpose of the pilot study was to select the most appropriate scale for use in Studies 1 and 2 in the PEAC system conditions. The scale "Interesting" was selected for the following reasons:

1) it loaded highly within its factor across both subject matters (Instructional: 0.88; Informational: 0.73)
2) it emerged as part of the same factor in both subject matters and as such was probably more similar across conditions than other scales.
3) it was considered more appropriate than the only other scale that met the above criteria (i.e. Friendly), which would tend to measure the individual personalities, rather than the overall program.

Table 3. Varimax rotated factor matrix of 22 attitudinal scale for the Instructional program.

SCALE	FACTOR						
	1	2	3	4	5	6	7
DEPENDABLE	.8289						
INFORMED	.8178						
FRIENDLY	.7925						
INTERESTING		.8833					
GOOD		.8081					
RELIABLE		.6095					
SUPERIOR			.6434				
CONFIDENT			.8575				
STRONG			.5842				
CALM			.6610				
GENTLE				.8556			
CAUTIOUS				.7781			
HUMANE					.8528		
PLEASANT					.6577		
SINCERE						-.5935	
SERIOUS						-.6382	
RELAXED						-.6736	
WARM							.5756
HONEST							.9063
EIGENVALUE	6.35	2.48	2.26	2.13	1.41	1.25	1.10
% VARIANCE	28.80	11.30	10.30	9.70	6.40	5.70	5.00

Table 4. Varimax rotated factor matrix of 22 attitudinal scales for the Informational program.

SCALE	FACTOR 1	2	3	4	5	6	7
RELAXED	.6992						
CALM	.7432						
HUMANE	.7840						
WARM	.6419						
GENTLE	.7856						
PLEASANT	.8080						
CAUTIOUS	.6456						
FRIENDLY	.8038						
INTERESTING		.7268					
DEPENDABLE		.6258					
INFORMED		.7920					
HONEST		.7707					
CONFIDENT			.5506				-.6078
STRONG			-.8644				
NOT NERVOUS			.7562				
SUPERIOR				.5866			
PERSUASIVE				.7401			
PROFOUND				.6720			
SERIOUS					-.6436		
GOOD					.7919		
SINCERE						.9129	
RELIABLE							.6154
EIGENVALUE	5.75	2.99	2.06	1.74	1.34	1.21	1.04
% VARIANCE	26.10	13.60	9.40	7.90	6.10	5.50	4.80

Study 1

Previous research has demonstrated a number of covert variables which affect viewer's perceptions and attitudes (Sullivan et al., 1979; Baggaley, et al., 1980) as measured by traditional paper and pencil evaluation instruments. This study was performed to determine whether or not the PEAC system. per se. has an effect on viewer's assessments of how they feel about and what they learn from instructional programming as compared to more traditional evaluation instruments.

Subjects:

Subjects were one hundred and sixty-six (166) college freshmen, 96 males and 70 females with a mean age of 17 years. These *Ss*, comprising six classes, were randomly selected from the Introductory Psychology course. Subjects in each class were randomly assigned to one of the two experimental treatments, 82 *Ss* being assigned to condition 1, and 84 *ss* assigned to condition 2.

Instruments:

Attitude Scale:

The Likert scale administered in the Pilot Study was again used as a measure of *Ss'* attitudes towards the program. The only variation was an addition to the scale of a request for the *Ss'* hand unit number placed on the top of the scale (see Appendix E).

Perceived Effectiveness scale:

A duplicate of the scale used to evaluate the perceived effectiveness of the Likert-type scale in conveying the *Ss'* attitudes towards the program was administered to *Ss* in condition I to evaluate the use of the PEAC system as an alternate

evaluation instrument (see Appendix F).

Program:

The instructional program evaluated in Study 1 was entitled "An Introduction to Memory" and is described in detail in the Pilot Study with the complete script being Appendix B.

Achievement Test:

An achievement test consisting of 16 multiple-choice questions covering the topics discussed in the instructional program was also administered (see Appendix G).

Procedure:

Six classes, totally 166 Ss, were used in Study 1. The E set up the videocassette recorder and monitor at the front of the classroom prior to the class meeting. The E also wrote on the blackboard the four (4) keys and the scales that they represented for those that were to use the PEAC system. These were:

A - interesting

B - moderately interesting

C - moderately uninteresting

D - uninteresting

At the commencement of the regular class period the E introduced the experiment to the class and gave the following instructions:

"The Psychology department in conjunction with MUN ETV are putting this course, Psychology 1000, onto videotape which will be aired on Cable channel 13 this semester for those that cannot come to the university. One of these video tapes is entitled "Introduction to Memory" which we will look at today. We would

like your impressions/attitudes - what you think of it. After the program we would like you to fill in an attitude scale and complete an achievement test.

Half of the class will evaluate this program as you watch it by using these hand-held response units which I will give out shortly. (E holds up a hand unit for all to see). There are 16 buttons on each of these boxes but we only want you to use the top four (4) buttons labelled A, B, C, D.

On the blackboard here, I have written exactly what each button will represent. For example, if you think that what you see is interesting - press button A; if you think it is moderately interesting - press button B; press button C if you think it is moderately uninteresting; press button D if you think it is uninteresting.

You may press as often as you wish and you may change your opinions as often as you wish (E puts hand unit back into collection case). It will take approximately one minute for the units to come on after I turn on this switch. (E turns on collection case switch, and then randomly distributes hand units, but keeping hand unit #20 as the master unit).

The E then explains that after the one minute has expired a small red light will appear in the left-hand side of each unit's display window. When the small red light appears in the E's master unit's display window he asks Ss if they now see the small red light on their units. After confirming that all units are now operational, the E turns on the videocassette recorder to start the program. At a predetermined point at the beginning of the

program the *E* presses button A on his master unit while at the same time instructing *Ss* to press button B to begin, and after which *Ss* may respond as they wish.

Upon completion of the program the *E* presses button B to record the end of the program after which those *Ss* who used the hand units are given the Perceived Effectiveness scale (Appendix F) and are asked to indicate how effective they feel this method of evaluation is in evaluating the program. These *Ss* are also asked to fill in their hand unit number in the space provided and are directed to the bottom end of the unit where the unit's number is located.

While *Ss* in condition 1 (those who used the PEAC units) are completing the perceived effectiveness scale for the PEAC units the *E* distributes the attitude scale (Appendix E) and the achievement test which is attached to it (Appendix G) to *Ss* of both condition 1 (with PEAC) and 2 (those without PEAC units). Subjects in condition 1 were asked to record immediately their hand units numbers in the space provided in the upper right-hand corner of the attitude scale.

Subjects in both conditions were asked then to record their names, sex, age and Grade eleven averages in the spaces provided. The *E* then asked all *Ss* to indicate their impressions of the program they had just watched by filling out the attitude scale. The *E* explained the instructions using the example given and asked *Ss* to circle only one number per line. After completing the attitude scale, all *Ss* were instructed to indicate how effective they felt the attitude scale was in aiding them in evaluating the

program. They then completed the achievement test. While Ss were completing the attitude scale the E collected the hand units and the perceived effectiveness scale for the PEAC units that were distributed earlier to Ss in condition 1. The E then placed all hand units back into the collection case, making sure that the master unit was replaced last and then turned off the collection case switch. The E then collected the completed package of attitude scale, Perceived Effectiveness scale, and the achievement test. The E then thanked the Ss for their cooperation and dismissed the class.

RESULTS AND DISCUSSION

Table 5 presents the means and standard deviations for both condition 1 and condition 2 for age, grade eleven average (grav), perceived effectiveness of the attitude scale as an evaluation method (eff), perceived effectiveness of the PEAC system (peff) - only application to condition 1, and the achievement scores obtained on the 16 multiple choice test on the content of the instructional program.

Table 5 Means and Standard Deviations for selected variables by condition.

	Condition 1			Condition 2		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD
AGE	81	17.40	2.71	83	17.08	1.64
GRAV	80	75.53	8.57	81	75.84	8.66
EFF	77	3.12	1.38	80	3.46	1.47
PEFF	79	3.01	1.52	No Peff administered		
ACH.	82	9.67	2.52	84	9.75	2.68

Inspection of Table 5 demonstrates that the $\bar{X}$ s for *Ss* in condition 1 were approximately equivalent to those in condition 2 in terms of age ($\bar{X}$=17.34 vs. 17.08), grade eleven average ($\bar{X}$=75.34 vs. 75.84), perceived effectiveness of the attitude scale ($\bar{X}$=3.12 vs. 3.46), and achievement scores ($\bar{X}$=9.67 vs. 9.75). To determine whether or not there was any significant differences between conditions 1 and 2 on any of these variables, one way analyses of variance (ANOVA) were done. Tables 6, 7, 8 and 9 show that there were no significant differences between conditions on these variables.

Table 6 One-way analysis of variance of age by condition.

SOURCE	DF	SS	MS	F. RATIO	F. PROBE
BETWEEN	1	3.97	3.97	0.80	N.S.
WITHIN	162	807.76	4.99		
TOTAL	163	811.73			

Table 7. One-way analysis of variance of grade eleven average by condition.

SOURCE	DF	SS	MS	F. RATIO	F. PROB.
BETWEEN	1	3.89	3.89	0.05	N.S.
WITHIN	159	11812.76	74.29		
TOTAL	160	11816.65			

Table 8. One-way analysis of variance of perceived effectiveness for the attitude scale by condition.

SOURCE	DF	SS	MS	F. RATIO	F. PROB.
BETWEEN	1	4.69	4.69	2.32	N.S.
WITHIN	155	313.84	2.03		
TOTAL	156	318.52			

Table 9. One-way analysis of variance of achievement by condition

SOURCE	DF	SS	MS	F. RATIO	F. PROB.
BETWEEN	1	0.26	0.26	0.04	N.S.
WITHIN	164	1109.85	6.77		
TOTAL	165	1110.11			

The measures obtained for the perceived effectiveness of the PEAC system (PEFF) occurs only in condition 1. There is no such measure in condition 2 that would warrant comparisons. However, a comparison can be made within condition 1, between the perceived effectiveness of two different types of evaluation instruments, the attitude scale (EFF - $\bar{X}$ = 3.12) and the PEAC system (PEFF - $\bar{X}$= 3.01). A t-test was conducted comparing the perceived effectiveness of these two instruments. It was found that *Ss* within condition 1 did not significantly find one method of evaluation superior to the other (t= 0.62, df= 74, n.s.).

Subjects in both conditions evaluated the instuctional program "Introduction to Memory" using the twenty-two (22) scale Likert-type attitude scale. The means and standard deviations for each condition of the attitude scale are presented in Table 10. It can be seen that the mean ratings in condition 1 ranged from 2.02 to 3.72, that is from Quite positive (2) to Can't Decide (4). The range for the mean ratings for condition 2 was 2.04 to 3.71 which is approximately the same as condition 1. Though the range of mean ratings for both conditions 1 and 2 were approximately equivalent, differences were found when individual scales were compared across condition (e.g. Humane: condition 1 $\bar{X}$ = 2.44 *ys* condition 2 $\bar{X}$ = 2.79). To determine whether or not these individual scale differences were significant the Tukey A procedure (Winer, 1972) was done for each scale across condition.

Table 10. Means and Standard Deviations of the 22 attitude scales for conditions 1 and 2.

	CONDITION 1			CONDITION 2		
SCALE	N	$\bar{X}$	SD	N	$\bar{X}$	SD
SINCERE	82	2.99	1.27	84	2.86	1.15
SUPERIOR	82	3.60	1.04	80	3.63	0.93
CONFIDENT	78	2.97	1.30	83	2.88	1.27
SERIOUS	82	2.76	1.35	83	2.78	1.47
RELAXED	82	3.09	1.57	81	2.91	1.39
STRONG	82	3.42	1.31	82	3.45	1.29
PERSUASIVE	82	2.93	1.25	84	3.05	1.45
PROFOUND	82	3.72	1.01	80	3.71	1.23
INTERESTING	81	3.09	1.57	84	3.37	1.85
DEPENDABLE	81	3.04	1.30	84	2.83	1.13
CALM	82	2.87	1.29	84	2.98	1.35
HUMANE	81	2.44	1.27	82	2.79	1.17
WARM	81	2.80	1.01	83	3.02	1.05
INFORMED	81	2.32	1.40	82	2.23	1.24
GOOD	82	2.45	1.19	84	2.71	1.40
GENTLE	82	3.11	1.14	83	3.17	1.18
HONEST	82	2.02	1.09	84	2.04	1.23
RELIABLE	82	2.87	1.47	84	2.49	1.38
PLEASANT	82	2.56	1.25	84	2.74	1.14
CAUTIOUS	82	3.50	1.13	84	3.32	1.09
FRIENDLY	82	2.11	1.10	84	2.30	1.07
NOT NERVOUS	82	3.04	1.74	83	3.05	1.51

Table 11 shows the results of these analyses. None of the 22 scales were significantly different when compared across condition. The data for each condition was then submitted to a principal components analysis to examine the attitudinal dimensions evaluated and to determine whether or not these dimensions were equivalent across conditions. Kaiser's rule was used to extract factors that had eigenvalues greater than 1.00. Extracted factors were orthogonally rotated using the Varimax procedure, and factor loadings of $\geq .55$ were considered meaningful for the purposes of factor definition.

The results of this analysis for condition 1 are presented in Table 12, which shows that 8 factors were extracted that accounted for 51% of the total variance. The scales that significantly defined each of these factors (i.e. loadings $\geq .55$) are also presented in Table 12. The full factor matrix, with associated eigenvalues and communalities, for this analysis is presented in Table 1, Appendix H.

The principal component analysis for condition 2 yielded a quite different pattern of factors. Seven factors were extracted that accounted for 42% of the total variance, but, as can be seen from Table 13, the scales that significantly defined these factors were considerably different from the analysis for condition 1. For example, the 8 factors comprising condition 1 accounted for 21 of the 22 scales whereas condition 2, had 7 factors comprising of only 17 of the 22 scales. It can also be seen that the structure of factors differed according to condition. For example, in condition 1, the scales Strong,

Peruasive. Profound, and Interesting constituted Factor 1, whereas Factor 1 in condition 2 comprised the following scales: Confident, Strong, Good, and Interesting.

The full factor matrix, with associated eigenvalues and communalities, for the principal component analysis of condition 2 is presented in Table 2, Appendix H.

The differences found in attitudinal dimensions when compared across condition using the principal component analysis provide strong evidence that evaluations obtained using the PEAC system versus more traditional ratings scales are not comparable. Contrary to the implicit assumption made by researchers who use the PEAC system, it is not equivalent to more traditional evaluation methods. It is clear from the present study that subjects given the PEAC system evaluate different aspects of a program than those given only more traditional instruments. In that subjects are not aware of this influence, i.e., there are no differences in perceived effectiveness across evaluation methods, the PEAC system behaves in effect like other covert variables that have an influence on subjects' perceptions.

To determine whether these patterns of differences were attributable to sex, further analyses were performed. Table 14 presents the means and standard deviations of the 22 scales for conditions 1 and 2 broken down by the variable sex. Inspection of these tables shows that male and female ratings are quite similar. This was confirmed by t-tests which indicated significant differences between male and female subjects' ratings for 2 scales in condition 1 and none in condition 2 (see Table 15

for condition 1 and Table 16 for condition 2). The two significant scales in condition 1 are undoubtedly an artifact of performing multiple t-tests (Johnson and Jones, 1972; Petrinovich and Hardyck, 1969). That is, when performing as many as 22 t-tests, several will be statistically significant simply by chance. It can be concluded that males and females did not differ on their ratings of individual attitude scales.

Table 11. T-test comparisons of Conditions 1 and 2 for the 22 attitude scales.

SCALE	COND	N	$\bar{X}$	SD	T value	DF	Prob.
SINCERE	1	82	2.99	1.27	0.69	164	NS
	2	84	2.86	1.15			
SUPERIOR	1	82	3.60	1.04	-0.18	160	NS
	2	80	3.63	0.93			
CONFIDENT	1	78	2.97	1.30	0.47	159	NS
	2	83	2.88	1.27			
SERIOUS	1	82	2.76	1.35	-0.12	163	NS
	2	83	2.78	1.47			
RELAXED	1	82	3.09	1.57	0.74	161	NS
	2	81	2.91	1.39			
STRONG	1	82	3.42	1.31	-0.18	162	NS
	2	82	3.45	1.29			
PERSUASIVE	1	82	2.93	1.25	-0.58	164	NS
	2	84	3.05	1.45			
PROFOUND	1	82	3.72	1.01	0.04	160	NS
	2	80	3.71	1.23			
INTERESTING	1	81	3.09	1.57	-1.06	163	NS
	2	84	3.37	1.85			
DEPENDABLE	1	81	3.04	1.30	1.08	163	NS
	2	84	2.83	1.13			
CALM	1	82	2.87	1.29	-0.54	164	NS
	2	84	2.98	1.35			
HUMANE	1	81	2.44	1.27	-1.82	161	NS
	2	82	2.79	1.17			
WARM	1	81	2.80	1.01	-1.38	162	NS
	2	83	3.02	1.05			
INFORMED	1	81	2.32	1.40	0.43	161	NS
	2	82	2.23	1.24			
GOOD	1	82	2.45	1.19	-1.30	164	NS
	2	84	2.71	1.40			
GENTLE	1	82	3.11	1.14	-0.33	163	NS
	2	83	3.17	1.18			
HONEST	1	82	2.02	1.09	-0.06	164	NS
	2	84	2.04	1.23			
RELIABLE	1	82	2.87	1.47	1.70	164	NS
	2	84	2.49	1.38			
PLEASANT	1	82	2.56	1.25	-0.95	164	NS
	2	84	2.74	1.14			
CAUTIOUS	1	82	3.50	1.13	1.04	164	NS
	2	84	3.32	1.09			
FRIENDLY	1	82	2.11	1.10	-1.11	164	NS
	2	84	2.30	1.07			
NOT NERVOUS	1	82	3.04	1.74	-0.05	163	NS
	2	83	3.05	1.51			

Table 12. Varimax rotated factor matrix of 22 attitude scales for condition 1.

SCALE	FACTOR							
	1	2	3	4	5	6	7	8
STRONG	.7830							
PERSUASIVE	.6195							
PROFOUND	.6573							
INTERESTING	.7239							
HUMANE		.7078						
GENTLE		.5843						
HONEST		.7079						
SUPERIOR			.6215					
CONFIDENT			.5686					
CALM			.7244					
DEPENDABLE				.5950				
CAUTIOUS				.8053				
GOOD					.5967			
RELIABLE					.8105			
RELAXED						.6333		
NOT NERVOUS						.8094		
SINCERE							.8666	
PLEASANT							.5670	
FRIENDLY							.5588	
SERIOUS								-.5952
INFORMED								.7129
EIGENVALUES	5.03	2.22	1.71	1.54	1.45	1.17	1.05	1.01
% VARIANCE	22.90	10.10	7.80	7.00	6.60	5.30	4.80	4.60

Table 13. Varimax rotated factor matrix of 22 attitude scales for condition 2.

SCALE	FACTOR						
	1	2	3	4	5	6	7
CONFIDENT	.6665						
STRONG	.7899						
GOOD	.5605						
INTERESTING	.5678						
PERSUASIVE		.5642					
DEPENDABLE		.7415					
SINCERE		.7772					
HUMANE			.6284				
HONEST			.5654				
RELAXED			.7873				
NOT NERVOUS				.8072			
CALM				.7006			
WARM					.6829		
SERIOUS					.7639		
GENTLE						-.7255	
PROFOUND						.6002	
CAUTIOUS							-.6379
							.6210
EIGENVALUE	5.04	2.31	1.72	1.59	1.41	1.33	1.07
% VARIANCE	22.90	10.50	7.80	7.20	6.40	6.00	4.90

Table 14. Means and Standard Deviations of the 22 attitude scales and other selected variables for conditions 1 and 2 by sex.

		CONDITION 1			CONDITION 2		
SCALE	SEX	N	$\bar{X}$	SD	N	$\bar{X}$	SD
SINCERE	1	42	3.00	1.08	54	2.82	1.15
	2	40	2.98	1.46	29	3.00	1.13
SUPERIOR	1	42	3.64	1.10	51	3.61	0.80
	2	40	3.55	0.99	28	3.71	1.12
CONFIDENT	1	38	3.18	1.23	54	2.94	1.20
	2	40	2.78	1.35	28	2.79	1.42
SERIOUS	1	42	2.62	1.25	54	2.83	1.58
	2	40	2.90	1.45	28	2.75	1.24
RELAXED	1	42	3.31	1.69	52	2.79	1.33
	2	40	2.85	1.42	28	3.21	1.45
STRONG	1	42	3.48	1.38	54	3.61	1.22
	2	40	3.35	1.23	27	3.22	1.34
PERSUASIVE	1	42	2.98	1.30	54	3.02	1.46
	2	40	2.88	1.20	29	3.17	1.42
PROFOUND	1	42	3.79	0.95	53	3.89	1.19
	2	40	3.65	1.08	27	3.37	1.28
INTERESTING	1	41	3.17	1.67	54	3.54	1.80
	2	40	3.00	1.47	29	3.14	1.92
DEPENDABLE	1	41	3.10	1.30	54	2.74	0.96
	2	40	2.98	1.31	29	3.03	1.40
CALM	1	42	3.14	1.28	54	2.93	1.26
	2	40	2.58	1.26	29	3.14	1.51
HUMANE	1	42	2.52	1.31	52	2.81	1.12
	2	39	2.36	1.22	29	2.79	1.29
WARM	1	42	2.76	1.03	54	3.04	1.08
	2	39	2.85	0.99	28	3.04	1.00
INFORMED	1	42	2.55	1.57	53	2.34	1.22
	2	39	2.08	1.18	28	2.07	1.27
GOOD	1	42	2.48	1.13	54	2.61	1.25
	2	40	2.43	1.26	29	2.97	1.64
GENTLE	1	42	3.24	1.27	54	3.02	1.12
	2	40	2.98	1.00	28	3.50	1.23
HONEST	1	42	2.05	1.10	54	2.00	1.10
	2	40	2.00	1.09	29	2.14	1.46
RELIABLE	1	42	3.00	1.31	54	2.59	1.45
	2	40	2.73	1.63	29	2.35	1.26
PLEASANT	1	42	2.83	1.38	54	2.74	1.03
	2	40	2.28	1.04	29	2.79	1.32
CAUTIOUS	1	42	3.48	1.27	54	3.37	1.02
	2	40	3.53	0.96	29	3.28	1.22
FRIENDLY	1	42	2.29	1.33	54	2.30	1.08
	2	40	1.93	0.76	29	2.35	1.17
NOT NERVOUS	1	42	3.17	1.82	53	3.21	1.51
	2	40	2.90	1.66	29	2.79	1.52

Table 14 (Con'd)

		CONDITION 1			CONDITION 2		
SCALE	SEX	N	$\bar{X}$	SD	N	$\bar{X}$	SD
AGE	1	42	16.98	0.68	54	17.15	1.94
	2	39	17.85	3.82	29	16.97	0.87
GRAV	1	41	73.76	8.41	52	75.81	8.87
	2	39	77.39	8.45	29	75.90	8.45
EFF	1	37	2.73	1.31	52	3.44	1.35
	2	40	3.48	1.36	27	3.59	1.65
PEFF	1	40	2.93	1.56	NO PEAC		
	2	39	3.10	1.50			
ACH	1	42	9.50	2.82	54	9.96	2.75
	2	40	9.85	2.19	29	9.31	2.57

Table 15. T-test comparisons of male and female responses to the 22 attitude scales for condition 1.

VAR.	SEX	N	$\bar{X}$	SD	T VALUE	DF	PROB.
SINCERE	1	42	3.00	1.08	0.09	80	NS
	2	40	2.98	1.46			
SUPERIOR	1	42	3.64	1.10	0.40	80	NS
	2	40	3.55	0.99			
CONFIDENT	1	38	3.18	1.23	1.40	76	NS
	2	40	2.78	1.35			
SERIOUS	1	42	2.62	1.25	-0.94	80	NS
	2	40	2.90	1.45			
RELAXED	1	42	3.31	1.69	1.33	80	NS
	2	40	2.85	1.42			
STRONG	1	42	3.48	1.38	0.44	80	NS
	2	40	3.35	1.23			
PERSUASIVE	1	42	2.98	1.30	0.37	80	NS
	2	40	2.88	1.20			
PROFOUND	1	42	3.79	0.95	0.61	80	NS
	2	40	3.65	1.08			
INTERESTING	1	41	3.17	1.67	0.49	79	NS
	2	40	3.00	1.47			
DEPENDABLE	1	41	3.10	1.30	0.42	79	NS
	2	40	2.98	1.31			
CALM	1	42	3.14	1.28	2.02	80	p>.05
	2	40	2.58	1.26			
HUMANE	1	42	2.52	1.31	0.58	79	NS
	2	39	2.36	1.22			
WARM	1	42	2.76	1.03	-0.37	79	NS
	2	39	2.85	0.99			
INFORMED	1	42	2.55	1.57	1.52	79	NS
	2	39	2.08	1.18			
GOOD	1	42	2.48	1.13	0.19	80	NS
	2	40	2.43	1.26			
GENTLE	1	42	3.24	1.27	1.04	80	NS
	2	40	2.98	1.00			
HONEST	1	42	2.05	1.10	0.20	80	NS
	2	40	2.00	1.09			
RELIABLE	1	42	3.00	1.31	0.84	80	NS
	2	40	2.73	1.63			
PLEASANT	1	42	2.83	1.38	2.07	80	p>.05
	2	40	2.28	1.04			
CAUTIOUS	1	42	3.48	1.27	-0.20	80	NS
	2	40	3.53	0.96			
FRIENDLY	1	42	2.29	1.33	1.50	80	NS
	2	40	1.93	0.76			
NOT NERVOUS	1	42	3.17	1.82	0.69	80	NS
	2	40	2.90	1.66			

Table 16. T-test comparisons of male and female responses to the 22 attitude scales for condition 2.

VAR	SEX	N	$\bar{X}$	SD	T VALUE	DF	PROB.
SINCERE	1	54	2.82	1.15	-0.70	81	NS
	2	29	3.00	1.13			
SUPERIOR	1	51	3.61	0.80	-0.49	77	NS
	2	28	3.71	1.12			
CONFIDENT	1	54	2.94	1.20	0.53	80	NS
	2	28	2.79	1.42			
SERIOUS	1	54	2.83	1.58	0.24	80	NS
	2	28	2.75	1.24			
RELAXED	1	52	2.79	1.33	-1.32	78	NS
	2	28	3.21	1.45			
STRONG	1	54	3.61	1.22	1.31	79	NS
	2	27	3.22	1.34			
PERSUASIVE	1	54	3.02	1.46	-0.46	81	NS
	2	29	3.17	1.42			
PROFOUND	1	53	3.89	1.19	1.79	78	NS
	2	27	3.37	1.28			
INTERESTING	1	54	3.54	1.80	0.94	81	NS
	2	29	3.14	1.92			
DEPENDABLE	1	54	2.74	0.96	-1.13	81	NS
	2	29	3.04	1.40			
CALM	1	54	2.93	1.26	-0.68	81	NS
	2	29	3.14	1.51			
HUMANE	1	52	2.81	1.12	0.05	79	NS
	2	29	2.79	1.29			
WARM	1	54	3.04	1.08	0.01	80	NS
	2	28	3.04	1.00			
INFORMED	1	53	2.34	1.22	0.92	79	NS
	2	28	2.07	1.27			
GOOD	1	54	2.61	1.25	-1.10	81	NS
	2	29	2.97	1.64			
GENTLE	1	54	3.02	1.12	-1.78	80	NS
	2	28	3.50	1.23			
HONEST	1	54	2.00	1.10	-0.49	81	NS
	2	29	2.14	1.46			
RELIABLE	1	54	2.59	1.45	0.78	81	NS
	2	29	2.35	1.26			
PLEASANT	1	54	2.74	1.03	-0.20	81	NS
	2	29	2.79	1.32			
CAUTIOUS	1	54	3.37	1.02	0.38	81	NS
	2	29	3.28	1.22			
FRIENDLY	1	54	2.30	1.02	-0.20	81	NS
	2	29	2.35	1.17			
NOT NERVOUS	1	53	3.21	1.51	1.18	80	NS
	2	29	2.79	1.52			

A principal components analysis was performed for each of the sexes for each condition to determine the attitudinal dimensions evaluated by each sex. The Kaiser's rule was again used to extract factors that had eigenvalues greater than 1.00. Extracted factors were orthogonally rotated using the Varimax procedure, and factor loadings of $\geq .55$ were considered meaningful for the purposes of factor definition.

The results of these analyses are presented in Table 17 through Table 20 which present the number of factors extracted and the amount of the total variance that they represent. Also presented are the scales that significantly defined each of these factors (i.e. loadings $\geq .55$). The full factor matrices, with associated eigenvalues and communalities for the analyses presented in Table 17 through Table 20 are, respectively, presented in Tables 3 through to Table 6, Appendix H.

Table 17 presents the principal components analysis for condition 1 as evaluated by males. Seven factors were extracted which accounted for 55% of the total variance. These results are very different from the results for female *Ss* presented in Table 18. Here eight factors were extracted which accounted for 58% of the total variance. Comparisons of factors for these two groups (males v.s. females) show that there are factor pattern differences. For example, Factor 1 for males comprised 4 scales (Confident, Persuasive, Interesting and Dependable) whereas Factor 1 for females had only 2 scales (Gentle and Cautious) loading on it.

Table 17. Varimax rotated factor matrix of 22 attitude scales for males in condition 1.

SCALE	FACTOR						
	1	2	3	4	5	6	7
CONFIDENT	.7941						
PERSUASIVE	.8118						
INTERESTING	.6476						
DEPENDABLE	.6988						
SINCERE		.7186					
CALM		.6008					
PLEASANT		.8289					
FRIENDLY		.8309					
STRONG			.5656				
GOOD			.8112				
RELIABLE			.7461				
WARM				.6675			
INFORMED				.7361			
RELAXED					.9039		
NOT NERVOUS						.7933	
SUPERIOR							-.6159
SERIOUS							.6732
EIGENVALUE	5.89	2.42	2.00	1.78	1.55	1.34	1.19
% VARIANCE	26.80	11.00	9.10	8.10	7.00	6.10	5.40

Table 18. Varimax rotated factor matrix of 22 attitude scales for females in condition 1.

SCALE	FACTOR							
	1	2	3	4	5	6	7	8
GENTLE	.7764							
CAUTIOUS	.6615							
SUPERIOR		.7596						
CONFIDENT		.7272						
INTERESTING		.8024						
GOOD		.6933						
PROFOUND			.7106					
WARM			.7917					
PLEASANT			.7995					
RELAXED				.8462				
NOT NERVOUS				.6916				
CALM					.7604			
INFORMED					.8767			
STRONG						.6926		
DEPENDABLE						.6915		
SINCERE							.9285	
HONEST							.5597	
SERIOUS								.7564
EIGENVALUE	4.62	2.92	2.35	1.77	1.54	1.27	1.12	1.03
% VARIANCE	21.00	13.30	10.70	8.00	7.00	5.80	5.10	4.70

The principal components analysis for males and females for condition 2 are presented in Table 19 and Table 20, respectively. Both analyses extracted seven factors but accounted for different percentages of the total variance. The seven factors extracted in Table 19 (condition 2 - males) accounted for 48% of the total variance whereas those extracted in Table 20 (condition 2 - females) accounted for 64% of the total variance.

This difference in variance accounted for is probably related to the fact that the analysis for females extracted a stronger factor 1. Table 20 shows that factor 1 accounted for approximately one-half the variance and had a large number of scales comprising it. In contrast, factor 1 for males had only 2 scales and the number of scales for other factors were evenly distributed. There is greater variability in the dimensions males responded to than females.

Most importantly, major differences in factor patterns were also evident. For example, factor 1, for males comprised only two scales (Humane and Honest). Factor 1, for females had 8 scales (Superior, strong, interesting, dependable, informed, good, reliable and pleasant) loading on it and could be considered a general evaluative factor.

Table 19. Varimax rotated factor matrix of 22 attitude scales for males in condition 2.

SCALES	FACTOR						
	1	2	3	4	5	6	7
HUMANE	.7942						
HONEST	.6778						
PERSUASIVE		.7183					
INTERESTING		.7060					
DEPENDABLE		.7618					
SUPERIOR			.6394				
RELAXED			.5798				
PLEASANT			.6028				
NOT NERVOUS			.7011				
CALM				.8278			
WARM				.8338			
FRIENDLY				.5885			
CONFIDENT					.5783		
STRONG					.8078		
INFORMED					.7004		
SERIOUS						.7048	
RELIABLE						.7872	
CAUTIOUS							.7595
EIGENVALUE	4.73	2.47	2.01	1.84	1.71	1.29	1.18
% VARIANCE	21.50	11.20	9.10	8.40	7.80	5.90	5.40

Table 20. Varimax rotated factor matrix of 22 attitude scales for females in condition 2.

SCALE	FACTOR						
	1	2	3	4	5	6	7
SUPERIOR	.8409						
STRONG	.5850						
INTERESTING	.8321						
DEPENDABLE	.7165						
INFORMED	.5798						
GOOD	.8830						
RELIABLE	.8477						
PLEASANT	.5588	.5761					
HUMANE		.7075					
HONEST		.7847					
FRIENDLY		.7895					
CONFIDENT			.6804				
CAUTIOUS			.8788				
RELAXED				.8503			
NOT NERVOUS				.7609			
PROFOUND					.8597		
CALM					.5607		
INFORMED					.6167		
SINCERE						.8392	
GENTLE						.6699	
SERIOUS							-.8632
EIGENVALUE	6.47	2.73	2.06	1.83	1.77	1.40	1.31
% VARIANCE	29.40	12.40	9.40	8.30	8.00	6.40	5.90

To summarize the results of Study I, it was found that *Ss* did not perceive the PEAC system as more or less effective than the other method of evaluation, however, the PEAC system did affect their evaluation of the program. Subjects using the PEAC system evaluated the program on different dimensions than did those who used more traditional methods. It was also found that sex of viewer influenced how *Ss* perceived and evaluated the presentation. Lastly, the PEAC system did not influence achievement of instructional material.

To determine if the results obtained here using an instructional presentation can be generalized to a more consumer-oriented format, the study was replicated using an informational program (Study II).

STUDY II

The unique advantage of the PEAC system over previous electronic evaluation instruments has led to its extensive use and wide application in such areas as advertising, political campaigning, social impact studies and program development (Nickerson, 1979, 1980, 1981; Spears and Gillis, 1981; Baggaley et al., 1982; Myrick and Keegan, 1981; Chen et al., 1979). Study 1 demonstrated that the PEAC system does affect viewers' perceptions and attitudes in an instructional setting, Study II was a replication of that study, using an informational presentation to determine if the results obtained in Study 1 were generalizable to more consumer-oriented formats.

Subjects:

Subjects were one hundred and thirty-two (132) college freshmen, 66 males and 66 females with a mean age of 17 years. These *Ss*, comprising four classes, were randomly selected from the Introductory Psychology course. Subjects in each class were randomly assigned to the two experimental treatments. Of the four classes a total of 64 *Ss* were assigned to condition 1, while the remainder of the 132 *Ss* - 68 were assigned to condition 2.

Instruments:

Attitude Scale:

The same Likert-type scale administered in the Pilot Study and Study 1 was also used in Study 2 (see Appendix E).

Program:

The program used in Study 2 was that used in the Pilot Study - the CTV National News. See Appendix C for the complete

script.

Perceived Effectiveness Scale:

The single scale used to evaluate the PEAC system was also administered to those in condition 1 (see Appendix F).

Procedure:

Four classes, totalling 132 *Ss*, were used in Study 2. The procedure in this study was identical to that used in Study 1 with the one exception being that there was no achievement test administered.

RESULTS AND DISCUSSION

Data was collected for a total of 132 *Ss* and analyzed by condition. Condition 1 - *Ss* who used the PEAC system - comprised 64 *Ss* while condition 2 - *Ss* who did not use the PEAC system - comprised 68 *Ss*.

Table 21 presents the means and standard deviations for the variables age, grade eleven average, perceived effectiveness of the attitude scale (EFF), and perceived effectiveness of the PEAC system (PEFF) (only applicable to condition 1) for both condition 1 and condition 2.

It can be seen from Table 21 that *Ss* in condition 1 were approximately equivalent to *Ss* in condition 2 in terms of age ($\bar{X}$ = 17.18 vs. $\bar{X}$ = 17.15) and perceived effectiveness of the attitude scale ($\bar{X}$ = 3.18 vs. $\bar{X}$ = 3.42). However, it appears that *Ss* in both conditions were not equivalent in terms of grade eleven average - a measure of academic ability ($\bar{X}$ = 74.07 vs. $\bar{X}$ = 77.21). To determine whether or not the means for condition 1

were significantly different than those for condition 2, one way analyses of variance were performed for each of the variables presented in Table 21.

Table 21. Means and Standard Deviation for selected variables by condition.

	CONDITION 1			CONDITION 2		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD
AGE	62	17.18	1.42	68	17.15	1.68
GRAV	62	74.07	7.17	67	77.21	7.62
EFF	62	3.18	1.53	62	3.42	1.31
PEFF	63	3.18	1.52	No PEAC administered		

Table 22 indicates that there was no significant difference in the age of *Ss* in conditions 1 and 2. A one way analysis of variance for grade eleven average by condition, Table 23, confirms that the grade eleven average of *Ss* in condition 2($\bar{X}$ = 77.21) was significantly higher than for *Ss* in condition 1 ($\bar{X}$ = 74.07). However, Study 2 examined attitudes towards informational/entertainment material and did not investigate the relationship between instructional material and level of achievement, as Study 1.

Table 24 presents the results of a one way analysis of variance for perceived effectiveness of the attitude scale by condition. It can be seen that there was no significant difference in how *Ss* in each condition perceived the effectiveness of the attitude scale. This same comparison cannot be made for the perceived effectiveness of the PEAC system because only *Ss* in condition 1 employed the hand units. However, a comparison can be made between the perceived effectiveness of the attitude scale and the PEAC system for those *Ss* in condition 1. A t-test indicates that there was no significant difference in how *Ss* in condition 1 perceived the effectiveness of the attitude scale and the PEAC system (t = 0.23, df = 59, n.s.).

Table 22. One-way analysis of variance of age by condition

SOURCE	DF	SS	MS	F. RATIO	F. PROB.
BETWEEN	1	0.03	0.03	0.01	N.S.
WITHIN	128	311.58	2.43		
TOTAL	129	311.61			

Table 23. One-way analysis of variance of grade eleven average by condition.

SOURCE	DF	SS	MS	F. RATIO	F. PROB.
BETWEEN	1	318.49	318.49	5.80	P > .05
WITHIN	127	6970.80	54.89		
TOTAL	128	7289.30			

Table 24. One-way analysis of variance of perceived effectiveness for the attitude scale by condition.

SOURCE	DF	SS	MS	F. RATIO	F. PROB.
BETWEEN	1	1.82	1.82	0.89	N.S.
WITHIN	122	248.14	2.03		
TOTAL	123	249.96			

Subjects in both conditions evaluated the informational program using the same 22 scale Likert-type attitude scale employed in Pilot Study and in Study 1 (see Appendix A). Table 25 presents the means and standard deviations of each of the 22 scales by condition. The mean ratings for condition 1 ranged from 1.80 to 4.40 which corresponds to highly positive to moderately negative when positioned on the 1 to 7 point scale. The range of mean ratings found in condition 2 was 1.68 to 4.29 which is approximately the same as those found in condition 2.

To determine whether or not individual scale ratings were significantly different across condition, Tukey A (Winer, 1971) was performed for each of the 22 scales by condition. Table 26 presents the results of the t-test analysis and it can be seen that none of the 22 scales were rated significantly different across condition.

Table 25 Means and Standard Deviations of the 22 attitude scales for conditions 1 and 2.

	Condition 1			Condition 2		
SCALE	N	$\bar{X}$	SD	N	$\bar{X}$	SD
SINCERE	65	3.40	1.36	66	3.12	1.20
SUPERIOR	64	3.62	1.19	68	3.28	0.96
CONFIDENT	63	2.70	1.44	65	2.62	1.38
SERIOUS	65	1.80	1.28	68	1.68	1.11
RELAXED	63	3.83	1.41	68	3.91	1.72
STRONG	62	2.89	1.09	67	2.69	1.10
PERSUASIVE	64	3.11	1.46	66	3.09	1.43
PROFOUND	63	3.38	1.11	66	3.39	1.16
INTERESTING	65	3.22	1.43	68	3.06	1.55
DEPENDABLE	65	2.72	1.43	67	2.48	1.09
CALM	64	3.11	1.25	67	3.02	1.38
HUMANE	63	3.11	1.06	68	3.12	1.38
WARM	63	4.40	1.29	67	4.49	1.35
INFORMED	65	2.14	1.31	68	2.15	1.15
GOOD	64	2.88	1.29	67	2.87	1.51
GENTLE	63	4.40	1.04	68	4.29	1.12
HONEST	62	2.21	1.12	67	2.27	1.15
RELIABLE	65	2.63	1.67	67	2.31	1.45
PLEASANT	65	3.97	1.21	68	4.02	1.48
CAUTIOUS	64	3.75	1.14	67	3.69	1.05
FRIENDLY	65	3.35	1.12	67	3.30	1.31
NOT NERVOUS	64	3.16	1.32	67	2.91	1.68

Table 26. T-test comparisons of conditions 1 and 2 for the 22 attitude scales.

SCALE	COND	N	$\bar{X}$	SD	T VALUE	DF	PROB.
SINCERE	1	65	3.40	1.36	1.25	129	NS
	2	66	3.12	1.20			
SUPERIOR	1	64	3.61	1.20	1.76	130	NS
	2	68	3.28	0.96			
CONFIDENT	1	63	2.70	1.44	0.33	126	NS
	2	65	2.62	1.38			
SERIOUS	1	65	1.80	1.28	0.60	131	NS
	2	68	1.68	1.11			
RELAXED	1	63	3.83	1.41	-0.31	129	NS
	2	68	3.91	1.72			
STRONG	1	62	2.89	1.09	1.04	127	NS
	2	67	2.69	1.10			
PERSUASIVE	1	64	3.11	1.46	0.07	128	NS
	2	66	3.09	1.43			
PROFOUND	1	63	3.38	1.11	-0.06	127	NS
	2	66	3.39	1.16			
INTERESTING	1	65	3.22	1.43	0.60	131	NS
	2	68	3.06	1.55			
DEPENDABLE	1	65	2.72	1.43	1.11	130	NS
	2	67	2.48	1.09			
CALM	1	64	3.11	1.25	0.41	129	NS
	2	67	3.02	1.38			
HUMANE	1	63	3.11	1.06	-0.03	129	NS
	2	68	3.12	1.38			
WARM	1	63	4.40	1.29	-0.41	128	NS
	2	67	4.49	1.35			
INFORMED	1	65	2.14	1.31	-0.04	131	NS
	2	68	2.15	1.15			
GOOD	1	64	2.88	1.29	0.04	129	NS
	2	67	2.87	1.41			
GENTLE	1	63	4.40	1.04	0.54	129	NS
	2	68	4.29	1.12			
HONEST	1	62	2.21	1.12	-0.30	127	NS
	2	67	2.27	1.15			
RELIABLE	1	65	2.63	1.67	1.17	130	NS
	2	67	2.31	1.45			
PLEASANT	1	65	3.97	1.21	-0.19	131	NS
	2	68	4.02	1.48			
CAUTIOUS	1	64	3.75	1.14	0.33	129	NS
	2	67	3.69	1.05			
FRIENDLY	1	65	3.35	1.12	0.26	130	NS
	2	67	3.30	1.31			
NOT NERVOUS	1	64	3.16	1.32	0.93	129	NS
	2	67	2.91	1.68			

The data for each condition was then submitted to a principal components analysis to examine the attitudinal dimensions evaluated and to determine whether or not these dimensions were equivalent across condition. The same procedure used in study 1 was employed here.

Table 27 presents the results of this analysis for condition 1. Nine factors were extracted which accounted for 58% of the total variance. The scales that significantly defined each of these factors (i.e. loadings $\geq$ .55) are also presented in Table 27. The full factor matrix, with associated eigenvalues and communalities, for this analysis is presented in Table 1, Appendix I.

The principal components analysis for condition 2, presented in Table 28, resulted in a different factor pattern. Eight factors were extracted that accounted for 53% of the total variance. Table 28 also presents the scales that significantly defined these factors (i.e. loadings $\geq$ .55). The full factor matrix, with associated eigenvalues and communalities, for the principal components analysis of condition 2 is presented in Table 2, Appendix I.

A comparison of the results obtained for condition 1 and condition 2 indicates that *Ss* evaluated the program on different attitudinal dimensions. For example, *Ss* in condition 1 evaluated the program on nine distinct dimensions, comprising 18 of the 22 scales and accounting for 58% of the total variance while *Ss* in condition 2 only perceived 8 distinct dimensions comprising 20 of the 22 scales which accounted for 53% of the total variance.

Closer inspection of the individual factors reveals more differences between the two groups. For example, in condition 1 the scales sincere, pleasant, friendly, and not nervous constituted the structure of factor 1, whereas factor 1 - condition 2 was comprised of five scales - relaxed, calm, humane, warm and pleasant.

Table 27. Varimax rotated factor matrix of 22 attitude scales for condition 1.

SCALE	FACTOR								
	1	2	3	4	5	6	7	8	9
SINCERE	.6983								
PLEASANT	.7020								
FRIENDLY	.7684								
NOT NERVOUS	.6225								
SUPERIOR		.7630							
CONFIDENT		.6793							
STRONG		.6573							
INFORMED			.6620						
CAUTIOUS			.8401						
WARM				.7699					
INTERESTING					.9119				
GOOD					.5816				
GENTLE						.8867			
HONEST							.5512		
RELIABLE							.8222		
PROFOUND								.8559	
CALM									.8442
HUMANE									.5531
EIGENVALUE	3.30	2.89	2.18	1.67	1.46	1.36	1.10	1.05	1.02
% VARIANCE	15.00	13.20	9.90	7.60	6.60	6.20	5.00	4.80	4.60

Table 28 Varimax rotated factor matrix of 22 attitude scales for Condition 2

SCALE	FACTOR							
	1	2	3	4	5	6	7	8
RELAXED	.7530							
CALM	.8349							
HUMANE	.7142							
WARM	.8242							
PLEASANT	.6677							
SINCERE		.6877						
CONFIDENT		.6347						
PROFOUND		.6825						
NOT NERVOUS		.6953						
STRONG			.7056					
INTERESTING			.8600					
PERSUASIVE				-.7635				
GENTLE				.7418				
SUPERIOR					.5865			
INFORMED					.7473			
RELIABLE					.7001			
DEPENDABLE						.5955		
HONEST						.8447		
SERIOUS							.9225	
CAUTIOUS								.9510
EIGENVALUE	5.40	2.47	1.90	1.63	1.37	1.25	1.17	1.04
% VARIANCE	24.60	11.20	8.60	7.40	6.20	5.70	5.30	4.70

Most significantly these results confirm and extend the findings of Study 1. Evaluations using the PEAC system and more traditional scales are different not only for instructional programs but also informational programs. It appears, then, that this effect is robust, occurring across different program types and formats. As in Study 1, the data were examined to determine if different patterns emerged by sex.

Table 29 presents the means and standard deviation for the 22 scales for each condition according to sex. T-tests were then performed to determine whether or not there was any significant difference between male and female subjects' ratings for each of the 22 scales per condition. Table 30 presents the results of these t-tests for condition 1. Twenty-one (21) of the 22 scales showed no significant differences between male and female ratings. The scale dependable was significantly rated more positively by males than females ($t = 2.19$; $df = 62$, $p>.05$). However, one out of 22 scales significant may have occurred by chance alone (Johnson and Jones, 1972; Petrinovich and Hardyck, 1969).

T-tests results for condition 2 are presented in Table 31 and indicate that there were no significant differences found between males and females on any of the 22 scales. A principal components analysis was performed to examine the attitudinal dimensions evaluated by male and female ratings for condition 1 and condition 2. The Kaiser's rule was used to extract factors that had eigenvalues greater than 1.00. Extracted factors were orthogonally rotated using the Varimax procedure, and factor

Table 29. Means and Standard Deviations of the 22 attitude scales and other selected variables for conditions 1 and 2 by sex.

		CONDITION 1			CONDITION 2		
SCALE	SEX	N	$\bar{X}$	SD	N	$\bar{X}$	SD
SINCERE	M	27	3.44	1.55	37	3.24	1.23
	F	37	3.35	1.23	29	2.97	1.15
SUPERIOR	M	26	3.54	1.10	39	3.15	0.88
	F	37	3.62	1.26	29	3.45	1.06
CONFIDENT	M	27	2.59	1.45	38	2.68	1.51
	F	35	2.74	1.46	27	2.52	1.19
SERIOUS	M	27	1.52	0.75	39	1.74	1.19
	F	37	1.97	1.54	29	1.59	1.02
RELAXED	M	26	3.62	1.63	39	4.03	1.78
	F	36	3.94	1.24	29	3.76	1.64
STRONG	M	25	3.00	1.00	38	2.71	1.14
	F	36	2.81	1.17	29	2.66	1.08
PERSUASIVE	M	27	3.22	1.50	37	3.24	1.62
	F	36	3.03	1.46	29	2.90	1.15
PROFOUND	M	27	3.44	1.22	37	3.22	1.25
	F	35	3.34	1.06	29	3.62	1.02
INTERESTING	M	27	2.96	1.45	39	2.82	1.57
	F	37	3.38	1.42	29	3.38	1.50
DEPENDABLE	M	27	3.15	1.61	38	2.47	1.11
	F	37	2.38	1.21	29	2.48	1.09
CALM	M	27	3.04	1.19	38	3.05	1.47
	F	36	3.14	1.31	29	2.97	1.27
HUMANE	M	27	3.19	1.18	39	3.23	1.40
	F	35	3.06	1.00	29	2.97	1.35
WARM	M	27	4.44	1.34	38	4.34	1.38
	F	35	4.40	1.27	29	4.69	1.31
INFORMED	M	27	2.37	1.62	39	2.13	1.15
	F	37	1.92	0.98	29	2.17	1.17
GOOD	M	27	2.70	1.35	39	2.69	1.34
	F	36	3.00	1.27	28	3.11	1.50
GENTLE	M	27	4.11	0.97	39	4.15	1.11
	F	35	4.57	1.04	29	4.48	1.12
HONEST	M	26	2.15	1.19	39	2.23	1.01
	F	35	2.20	1.05	28	2.32	1.34
RELIABLE	M	27	2.74	1.70	39	2.23	1.37
	F	37	2.51	1.68	28	2.43	1.57
PLEASANT	M	27	4.11	1.19	39	3.90	1.37
	F	37	3.87	1.25	29	4.17	1.63
CAUTIOUS	M	27	3.89	1.25	38	3.68	1.19
	F	36	3.61	1.05	29	3.69	0.85
FRIENDLY	M	27	3.41	1.28	38	3.05	1.23
	F	37	3.32	1.03	29	3.62	1.37
NOT NERVOUS	M	27	2.82	1.44	38	2.76	1.58
	F	36	3.39	1.20	29	3.10	1.80
EFF	M	26	2.81	1.33	36	3.42	1.32
	F	35	3.46	1.65	26	3.42	1.33
PEFF	M	27	3.26	1.66	NO PEFF		
	F	35	3.11	1.45			

Table 30. T-test comparisons of male and female responses to the 22 attitude scales for condition 1.

VAR	SEX	N	$\bar{X}$	SD	T VALUE	DF	PROB.
SINCERE	1	27	3.44	1.55	0.27	62	NS
	2	37	3.35	1.23			
SUPERIOR	1	26	3.54	1.10	-0.27	61	NS
	2	37	3.62	1.26			
CONFIDENT	1	27	2.59	1.45	-0.40	60	NS
	2	35	2.74	1.46			
SERIOUS	1	27	1.52	0.75	-1.42	62	NS
	2	37	1.97	1.54			
RELAXED	1	26	3.62	1.63	-0.90	60	NS
	2	36	3.94	1.24			
STRONG	1	25	3.00	1.00	0.68	59	NS
	2	36	2.8	1.17			
PERSUASIVE	1	27	3.22	1.59	0.52	61	NS
	2	36	3.03	1.46			
PROFOUND	1	27	3.44	1.	0.35	60	NS
	2	35	3.34	1.06			
INTERESTING	1	27	2.96	1.45	-1.14	62	NS
	2	37	3.38	1.42			
DEPENDABLE	1	27	3.15	1.61	2.19	62	p>.05
	2	37	2.38	1.21			
CALM	1	27	3.04	1.19	-0.32	61	NS
	2	36	3.14	1.31			
HUMANE	1	27	3.19	1.18	0.46	60	NS
	2	35	3.06	1.00			
WARM	1	27	4.44	1.34	0.13	60	NS
	2	35	4.40	1.27			
INFORMED	1	27	2.37	1.62	1.38	62	NS
	2	37	1.92	0.98			
GOOD	1	27	2.70	1.35	-0.89	61	NS
	2	36	3.00	1.27			
GENTLE	1	27	4.11	0.97	-1.78	60	NS
	2	35	4.57	1.04			
HONEST	1	26	2.15	1.19	-0.16	59	NS
	2	35	2.20	1.05			
RELIABLE	1	27	2.74	1.70	0.53	62	NS
	2	37	2.51	1.68			
PLEASANT	1	27	4.11	1.19	0.79	62	NS
	2	37	3.87	1.25			
CAUTIOUS	1	27	3.89	1.25	0.96	61	NS
	2	36	3.61	1.05			
FRIENDLY	1	27	3.41	1.28	0.29	62	NS
	2	37	3.32	1.03			
NOT NERVOUS	1	27	2.82	1.44	-1.72	61	NS
	2	36	3.39	1.20			

Table 31. T-test comparisons of male and female responses to the 22 attitude scales for condition 2.

VAR	SEX	N	$\bar{X}$	SD	T VALUE	DF	PROB.
SINCERE	1	37	3.24	1.23	0.94	64	NS
	2	29	2.97	1.15			
SUPERIOR	1	39	3.15	0.88	-1.26	66	NS
	2	29	3.45	1.06			
CONFIDENT	1	38	2.68	1.51	0.48	63	NS
	2	27	2.52	1.19			
SERIOUS	1	39	1.74	1,19	0.57	66	NS
	2	29	1.59	1.02			
RELAXED	1	39	4.03	1.78	0.63	66	NS
	2	29	3.76	1.64			
STRONG	1	38	2.71	1.14	0.20	65	NS
	2	29	2.66	1.08			
PERSUASIVE	1	37	3.24	1.62	0.98	64	NS
	2	29	2.90	1.15			
PROFOUND	1	37	3.22	1.25	-1.41	64	NS
	2	29	3.62	1.02			
INTERESTING	1	39	2.82	1.57	-1.48	66	NS
	2	29	3.38	1.50			
DEPENDABLE	1	38	2.47	1.11	-0.03	65	NS
	2	29	2.48	1.09			
CALM	1	38	3.05	1.47	0.25	65	NS
	2	29	2.97	1.27			
HUMANE	1	39	3.23	1,40	0.78	66	NS
	2	29	2.97	1.35			
WARM	1	38	4.34	1.38	-1.04	65	NS
	2	29	4.69	1.31			
INFORMED	1	39	2.13	1.15	-0,16	66	NS
	2	29	2.17	1.17			
GOOD	1	39	2.69	1.34	-1.19	65	NS
	2	28	3.11	1.50			
GENTLE	1	39	4.15	1,11	-1.20	66	NS
	2	29	4.48	1.12			
HONEST	1	39	2.23	1.01	-0.32	65	NS
	2	28	2.32	1.34			
RELIABLE	1	39	2.23	1.37	-0.55	65	NS
	2	28	2.43	1.57			
PLEASANT	1	39	3.90	1.37	-0.75	66	NS
	2	29	4.17	1.63			
CAUTIOUS	1	38	3.68	1.19	-0.02	65	NS
	2	29	3.69	0.85			
FRIENDLY	1	38	3.05	1.23	-1.78	65	NS
	2	29	3.62	1.37			
NOT NERVOUS	1	38	2.76	1.58	-0.82	65	NS
	2	29	3.10	1.80			

loadings of ≥ .55 were considered meaningful for the purposes of factor definition.

The results of these analysis are presented in Table 32 through Table 35 which present the number of factors extracted and the amount of the total variance that they represent. Also presented are the scales that significantly defined each of these factors (loadings ≥ .55). The full factor matrices, with associated eigenvalues and communalities for these analyses presented in Tables 32 - 35 are respectively presented in Table 3 through to Table 6 in Appendix I.

Table 32 presents the results of the principal components analysis for male subjects in condition 1. Eight factors were extracted which accounted for 65% of the total variance. The same analysis for females in condition 1, as presented in Table 33, also extracted eight factors but these account for 60% of the total variance. The scales that constitute the individual factors are, however, different for male and female subjects. For example, factor 1 for male *Ss* comprised the following 5 scales: sincere, dependable, humane, informed and cautious; whereas the same factor 1 for females *Ss* comprised 4 scales: superior, confident, serious and strong.

Table 32 Varimax rotated factor matrix of 22 attitude scales for males in condition 1

SCALE	FACTOR							
	1	2	3	4	5	6	7	8
SINCERE	.6927							
DEPENDABLE	.6147							
HUMANE	-.5683							
INFORMED	.7094							
CAUTIOUS	.6830							
SUPERIOR		.7179						
STRONG		.8160						
GOOD		.6099						
GENTLE		-.7064						
PLEASANT		.5561	.6355					
CONFIDENT			.8198					
RELAXED			.6650					
NOT NERVOUS			.6190					
SERIOUS				-.6934				
WARM				.8969				
HONEST					.8873			
INTERESTING						.8584		
CALM							-.7662	
FRIENDLY							.5849	
PROFOUND								.8835
EIGENVALUE	4.27	3.39	2.50	2.04	1.56	1.48	1.29	1.11
% VARIANCE	19.40	15.40	11.30	9.30	7.10	6.70	5.80	5.10

Table 33 Varimax rotated factor matrix of 22 attitude scales for females in condition 1

SCALE	FACTOR							
	1	2	3	4	5	6	7	8
SUPERIOR	.7271							
CONFIDENT	.8030							
SERIOUS	.7501							
STRONG	.7380							
PLEASANT		.7442						
FRIENDLY		.8394						
NOT NERVOUS		.7257						
CALM			.8464					
HUMANE			.8660					
GOOD				.7134				
CAUTIOUS				.8198				
DEPENDABLE					.9016			
RELAXED						.7408		
GENTLE						.8058		
PERSUASIVE							.7879	
INTERESTING								.7735
RELIABLE								.6933
EIGENVALUE	4.37	3.30	2.22	2.07	1.42	1.33	1.24	1.03
% VARIANCE	19.90	15.00	10.10	9.40	6.50	6.00	5.60	4.70

The principal components analyses for male and female *Ss* for condition 2 are presented in Table 34 and Table 35, respectively. Table 34 shows that for male *Ss*, eight factors were extracted which accounted for 64% of the total variance. Females in the same condition extracted seven factors which accounted for 63% of the total variance.

Although the differences are not as pronounced as in Study 1, it can be seen that males and females are evaluating different dimensions of the informational program.

In summary, both Studies 1 and 2 support the conclusion that the PEAC system leads to a different type of evaluation than traditional rating scale methods.

Table 34 Varimax rotated factor matrix of 22 attitude scales for males in condition 2

SCALE	FACTOR							
	1	2	3	4	5	6	7	8
RELAXED	.6626							
CALM	.8471							
HUMANE	.7991							
WARM	.7912							
PLEASANT	.6874							
DEPENDABLE		.7532						
HONEST		.7812						
RELIABLE		.8066						
SUPERIOR			.7599					
PERSUASIVE			.7526					
GENTLE			-.6597					
SINCERE				.6853				
PROFOUND				.8406				
STRONG					.6586			
INTERESTING					.8510			
INFORMED						.9044		
SERIOUS							.7479	
FRIENDLY							-.6110	
CAUTIOUS								.8937
EIGENVALUE	5.30	3.15	2.16	1.75	1.68	1.27	1.17	1.09
% VARIANCE	24.10	14.30	9.80	8.00	7.70	5.80	5.30	5.00

Table 35 Varimax rotated factor matrix of 22 attitude scales for females in condition 2

SCALE	FACTOR 1	2	3	4	5	6	7
RELAXED	.8479						
CALM	.8431						
WARM	.8061						
PLEASANT	.6077						
CONFIDENT		.6422					
DEPENDABLE		.8047					
GOOD		.6384					
GENTLE		.6405					
FRIENDLY		.5894					
SUPERIOR			.7699				
INTERESTING			.8102				
INFORMED			.6239				
RELIABLE			.6419				
SINCERE				.7875			
NOT NERVOUS				.8608			
STRONG					.7814		
PERSUASIVE					.8438		
HONEST					.5590		
SERIOUS						.9198	
PROFOUND						.5502	
HUMANE						.7007	
CAUTIOUS							.7977
EIGENVALUE	6.32	2.57	2.27	2.23	1.76	1.24	1.01
% VARIANCE	28.70	11.70	10.30	10.10	8.00	5.60	4.60

GENERAL DISCUSSION

The results obtained in Study 1 (instructional format) and Study 2 (informational format) were found to be consistent with each other and, as such, indicate the robustness of the results across two completely different presentation formats. These results may be summarized as follows:

1) *Ss* in Condition 1 did not perceive one method of evaluation as being more effective than the other; that is, they did not perceive the PEAC system as more effective than the traditional attitude scale measure or vice versa.

2) *Ss* did not significantly differ in their perceptions of the effectiveness of the traditional attitude scale measure across condition. Even though the PEAC system was employed by half of the *Ss*, it did not influence their ratings of the attitude scale measure.

3) there was no significant difference in achievement level between *Ss* across condition, that is, the PEAC system did not affect or influence achievement of instructional material (applicable only to Study 1).

The most interesting and profound finding was that involving the influence of the PEAC system upon *Ss*' evaluation of the presentations.

4) It was found that *Ss* using the PEAC system evaluated the presentations on different dimensions than those who did not use the PEAC system. For example, Factor Analysis of the attitude scales of conditions 1 and 2 resulted in different factor patterns and accounted for different amounts of the total variance. It may

be concluded , then, that the PEAC system affects how one views and evaluates a presentation.

5) It was also found, using factor analysis, that male and female *Ss* in each condition evaluated the presentation on different dimensions, that is, the factor patterns and percentage of total variance were different for male *Ss* as compared to female *Ss*. It may be concluded that how one views and evaluates a presentation also depends upon the sex of the viewer.

The prototype of the PEAC system was the Program Analyzer which was also used in conjunction with other methods of evaluation-questionnaires and interviews. An overall analysis of these varying types of evaluation methods produced a more complete and accurate investigation of the characteristics under study - more so than any one type itself. Even though the Program Analyzer was used as the basic blueprint for later developments and subsequent modifications to meet specific needs, the development of the methodology and interpretative skills was neglected. The more the electronic technology advanced, the more diluted the necessary skills of methodology and interpretation became.

The PEAC system, as we know it today, is a very sophisticated piece of electronic hardware, but it incorporates very simplistic statistical analysis programs which are tailor made for the producers who do not need, want or understand anything more complicated than the excellent graphics incorporated into the PEAC system. This is a very dangerous shortcoming of the PEAC system and a pitfall for those who use it. Unless sophisticated

statistics are performed upon data, covert relationships may not be discovered and researchers may act under erroneous conclusions. For example, in the present investigation, it was found using a comparisons of means and t-tests that there was no significant differences between the attitudes of those that employed the PEAC system and those who did not. However, using more sophisticated statistics - Factor Analysis - it was found that not only were there significant differences in attitude measures but that *Ss* formed these attitudes on quite different dimensions.

The fact that *Ss* using the PEAC system are evaluating a presentation on a different level than those using more traditional evaluation instruments creates the problem of how to interpret these results. We cannot understand these results in terms of traditional methods which are based on attitudes toward whole programs since we now know that they are each tapping a different level of perception. Systematic comparisons of the PEAC system with traditional methods must be done to explore the similarities and differences of these levels of perception.

Such information is requisite for any meaningful interpretation of PEAC-type data, especially when it necessarily involves implicit comparisons with traditional techniques. Such an endeavour, moreover, must take into account the differences in the physical makeup of these methods of evaluation. The more traditional method is basically a paper and pencil evaluation which is administered after the fact and, as such, measures a subject's overall attitude towards the program under study. The PEAC system, on the other hand, is an electronic hand-held unit

which the subject uses throughout the program, rating the program moment-by-moment as it progresses. This difference has great potential for studying important questions on attitude formation that have not been easily addressed. For example, are they formed during the program and, if so, what segments of the program are most important for the formation of the attitude? Or are attitudes formed after the program, giving the viewer time to consolidate all of the information needed to form such an attitude? Or are both types of attitudes formed?

If attitudes can be formed on a moment-by-moment basis as with the PEAC system, how do we determine what is representative of the program as a whole? What effect does registering a reaction moment-by-moment have on how one consolidates the entire program and forms an overall attitude towards it; what effect does one reaction have on the preceding segment's measure? Can we truly receive a reaction for one segment if the *S* has to register and process what he has just seen and can he attend to what comes after that while recording his reactions to the previous material? How long does all of this take - is there a delay time to be considered and accounted for when results have to be interpreted? Clearly, the PEAC system had important implications for such information processing questions and this constitutes another direction for future research with the PEAC system.

Another interesting line of future research involves issues concerning the Novelty effect which occurs with any new technolgy. Does the novelty of the PEAC system affect how *S*s use it; does it influence their reaction toward the program - would they have

formed an impression of a small, minute segment of a program if they did not have the urge to press buttons? Also, if the technology is novel, how efficient are Ss in understanding novel instructions of its use? Such a consideration may well indeed jeopardize the claim by some who see the PEAC system as an alternative in overcoming the barriers of illiteracy. Future research should address these issues.

There have been numerous studies and findings indicating that there are various covert variables, (e.g. camera angle, background) that affect viewers' attitudes using traditional evaluation instruments. It would be quite interesting to determine if covert variables influence PEAC ratings, and if so, in what manner?

The number of dimensions measured is also an important consideration for future research. The PEAC system is limited to only a few measures of a given dimension of behaviour; whereas traditional attitude scales can incorporate a variety of measures. Moreover, viewers in the traditional situation have only that task to perform and may take more time to consider how they feel, or may respond to a greater number of stimuli than is possible when concentrating on the PEAC task.

To summarize, traditional evaluation instruments have been used and studied for a long time and have produced a body of literature from which generalizations and theory have evolved. New electronic evaluation instruments are only beginning to appear and researchers cannot assume to apply the data collected with more traditional evaluation instruments to this new technology.

The present studies have shown that the PEAC system does affect attitude formation and as such, cannot be interpreted as if the PEAC system were similar to the traditional instruments. What is needed are more studies involving the PEAC system (and similar electronic evaluation methods) which will aid in the construction of its own unique body of theory and generalizations as well as the interrelationships with more traditional methods of evaluation.

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APPENDIX A

Attitude Scale
and
Perceived Effectiveness Scale
(for the Attitude Scale)
used in the Pilot Study

Name: _____ Sex: _____

Age: _____ Grade XI average _____

Please indicate below your impression of the videotape you have just seen.

Complete each scale separately and circle the number on the scale which most accurately reflects your impression of the videotape. For example, if you thought it was 'Quite Clear' on the scale below, you would circle number 2:

Clear 1 (2) 3 4 5 6 7 Unclear
Very Quite Moderately Can't Moderately Quite Very

Note: The other scales below are not written out in full, but the numbers in each case represent the same graded steps.

Insincere	1	2	3	4	5	6	7	Sincere
Superior	1	2	3	4	5	6	7	Inferior
Confident	1	2	3	4	5	6	7	Unsure
Serious	1	2	3	4	5	6	7	Humorous
Tense	1	2	3	4	5	6	7	Relaxed
Strong	1	2	3	4	5	6	7	Weak
Unpersuasive	1	2	3	4	5	6	7	Persuasive
Shallow	1	2	3	4	5	6	7	Profound
Interesting	1	2	3	4	5	6	7	Uninteresting
Undependable	1	2	3	4	5	6	7	Dependable
Agitated	1	2	3	4	5	6	7	Calm
Humane	1	2	3	4	5	6	7	Ruthless

Cold	1	2	3	4	5	6	7	Warm
Uninformed	1	2	3	4	5	6	7	Informed
Good	1	2	3	4	5	6	7	Bad
Gentle	1	2	3	4	5	6	7	Aggressive
Dishonest	1	2	3	4	5	6	7	Honest
Reliable	1	2	3	4	5	6	7	Unreliable
Unpleasant	1	2	3	4	5	6	7	Pleasant
Rash	1	2	3	4	5	6	7	Cautious
Unfriendly	1	2	3	4	5	6	7	Friendly
Not nervous	1	2	3	4	5	6	7	Nervous

How effective do you think this method of evaluation is?

Effective 1 2 3 4 5 6 7 Ineffective

Thank you

Appendix B

Introduction to Memory Script
for the
Pilot Study
and
Study 1

Memory I

Demonstration

In this tape, we will begin our discussion of a very important yet very complicated area of psychology - human memory. It is certainly fair to say that even today much still remains unknown about the human memory system, yet in the past 20-30 years a great deal has been discovered about the working of our memory.

As students you should be especially interested in this particular topic because anything that improves your memory should obviously be beneficial to you. I am sure that all of you have some idea of what your memory is; but to a psychologist the function of your memory is retention - your ability to hold on to information from the past - in other words, your ability to remember.

Measuring Retention

So if a psychologist wanted to study your memory, he would measure your retention. Let's take a look at the different ways he might do it. There are 3 common methods he might use:

1) Recognition

Here you are asked to pick out the correct material from your memory when you are given the appropriate cues. On an exam, multiple-choice and true-false items test your recognition memory. Errors in recognition memory can take any one of two forms:

1) you fail to recognize an item actually stored in your memory;

2) you claim to recognize an item not in your memory.

2) Recall

Here you are asked to generate or reproduce learned material given fewer cues as opposed to a recognition item. On exams, fill-in-the-blank and essay questions test recall memory. There are two types of recall.

Serial recall - here the material must be recalled in a specific order. The first item must be recalled as the first, the second, second, etc. while in free recall we are able to recall in any order. Because recognition tasks provide you with more cues to search memory, these tasks are usually easier than recall tasks.

3) Savings

Here retention is measured by comparing the time taken for original learning to the time taken to relearn the same material again, provided, of course, the original material is forgotten. When you are asked to relearn the same material again, it should take you less time the second time. If it does, this is called a time savings.

So those are the 3 common ways of measuring retention; now let's turn our attention to the different kinds of levels of memory that we have. Many of you may believe that we have only two kinds of memory - short and long term - not so - we have another kind that actually comes before we even use our short-term memory. This kind of memory is called Sensor Register.

In 1960 George Sperling presented subjects with CN array.

SLIDE

Of 15 numbers, these were presented for only a brief period (1/20 sec.), and after they went off, the subjects' task was to write down as many of the 15 as possible. Typically the subjects could recall only 5 or 6, but they reported that they "knew" more than 5 or 6 in the beginning; but by the time they had written down the 5 or 6 the others had faded away. Sperling tested this by following the array with a high, medium, or low tone to indicate to the subjects which line (row) they should report. Under these conditions subjects displayed almost perfect recall, indicating that immediately after the array presentation all 15 items are available, but then some fade away very quickly.

Sperling had discovered the sensory register in the visual system: just after any stimulus is presented we hold an exact picture of it for just a second before it fades away. In the visual system the sensory register is called ICONIC memory, after the Greek term ICON, which means picture. You should know what the same process is in the auditory (hearing) system. It's the echo - it lasts for just a second. So let's take a look at some of the general characteristics of the sensory register.

- large capacity (not unlimited)
- is exact representation of phsycial stimulus
- brief (lasts for no more than 1-2 seconds)
- occurs at the level of senses - not brain - it is believed that there is a sensory register for each sense.
- its purpose seems to be to provide a second or so during which the selection of information warranting further processing can take place.

Now let's turn to a second type of memory - one I'm sure you're familiar with: Short Term Memory.

Short Term Memory would be the type of memory you would use to keep a new telephone number in your mind before and while you were dialing it. Short term memory is temporary, active and conscious - it's our attention span. It is slightly more permanent than the sensory register, but it can hold much less material. Let's take a cOlloser look at some of these:

- Short Duration

Short term memory has its name because it doesn't last very long. The maximum duration of short term memory is about 10-20 seconds without rehearsal. If subjects are permitted to rehearse or repeat material, then it can be held in short term memory indefinitely but without rehearsal. Peterson and Peterson (1959) demonstrated that maybe even 20 seconds is too long. They presented subjects with a 3-consonant nonsense syllable (E X C Q) that the subjects had to recall. Now, immediately after the syllable was presented, the subjects had to count backwards by 3's aloud from some number supplied by the *E*. This was to prevent the *S* from rehearsing the syllable. Their results were as follows:

GRAPHIC

The longer the *E* let the *S* count, the less likely the *S* was to recall the syllable correctly and there was virtually no correct answers after 15 seconds, and that was for a 3-item syllable. So you can imagine how hard it would be for a 5-6 item syllable.

-Limited Capacity

How many items can you hold in your Short Term Memory; 4, 7, 10??? Well let's see. I'll call out some letters and you try to write them down, in order, when I'm finished.

- M T X P B Y G
- Y H C R D S M T L

In 1956 George Miller proposed a generally accepted theory concerning the capacity of Short Term Memory. Miller's belief is that the average person can hold 7 ± 2 items somewhere between 5 - 9. But did Miller mean 7 + 2 individual items. Let's try the same demonstration with numbers and see if you're any better.

- 4 6 3 8 5 2 9
- 7 3 0 8 4 1 6 2 5

You should have done better with the numbers vs. the letters. Most do. Why?

- More practice - no
- Numbers are important - no

Miller knew the answer - chunking. Chunking refers to any method of grouping or organizing material to make it more meaningful. So chunking (or grouping) can vastly improve your Short Term Memory, and numbers chunk easier than letters. Knowing this, try one more number and this time instead of remembering 730 as three separate numbers, chunk it and remember it as seven hundred and thirty. Here's the number 621495308. PAUSE. You all should have gotten that one correct. So using this method of chunking and with some practice many people can recall a 17-24 digit number. However, it's curious to note that

even in this case these people still average 7 chunks of material and the range is still 5 - 9.

A final characteristic of Short Term Memory that we'll mention is the serial search retrieval process. Given that you are holding information in your Short Term Memory, how do you search through this information to retrieve the material you want. Consider this example: Keep this number in your Short Term Memory, don't write it down, 83941. Now was 7 a digit in that number? The answer is no, but how did you arrive that answer? Did you compare 7 to the number as a whole all at once (parallel scanning) or did you first compare 7 to 8, then 7 to 3 and so on? (serial scanning). The answer is serial search. A psychologist by the name of Sternberg (1966) demonstrated that as the number of digits STM increased from 1 to 6, the longer it took the *S* to search through his short term memory. Since it took the *S* longer to respond to a 5-digit number as compared to a 3-digit number, then the search of retrieval process in short term memory must be serial.

Appendix C

CTV News Script
for
Pilot Study
and
Study II

Good evening, Poland is under heavy new Soviet pressure tonight with nearly 100,000 Russian soldiers massing along its northern border. The Russians say they are on maneuvers but the huge troop movements happen to coincide with the first national Congress of Poland's Independent Labour Union - Solidarity. Jean Reynold reports: "The announcement came tonight from the Tass news agency which said operational staffs, units and elements totaling nearly 100,000 were in staging areas and position. Code name West 81, the nine day exercise involved ground forces in Bella Russia and the Soviet Baltic Republics - both areas close to the Polish border and a naval flotilla estimated at 60 ships including an aircraft carrier in the Baltic Sea. According to Tass it is intensive training with conditions as close as possible to combat. Moscow's announcement about the size of the operations comes just a day after the government controlled news media here had described the exercise as nothing extraordinary with only a limited number of troops. It was a description that Western military observers found hard to believe, especially with Soviet Defense Minister Demitry putting in a rare field command appearance but no one was predicting a force of 100,000". Jean Reynold, NBC News, Moscow.

Solidarity's first congress was opened today at the port city of Gdansk only forty miles from the Soviet war games. The opening speeches and the whole style of the conference certainly did not give the Russians any reason to think that Poland would be pulled back into line. John Cochrane reports: "Solidarity, like the Communist Party, calls its convention a congress but unlike the

Party's, Solidarity began its congress with a Mass. The new Primate of Poland, Bishop Glemp, says he came here because the union is overwhelmingly loyal to the Church - no one more so than Lech Walesa who even wore a tie which he refuses to do when he is negotiating with the government. Archbishop Glemp appealed for 30 days of peace - no strikes, no confrontation with the authorities but the union does not always follow the Church's advice and what happens in this converted sports arena over the next 3 to 4 days may determine how militant Solidarity will be in its second year. As the 900 delegates arrived it was clear that the militant make up at the very least a small minority. There was Jon Gierek, the radical from Brzeg who was beaten by police 6 months ago and who is determined to fight the government wherever possible and from Silesian the colorful coal miners who blame the government for food shortages which had caused some miners to faint on the job. The man who will try to block the militants from taking control of the union is of course Lech Walesa. "If we stick together", says Lech Walesa, "we can have the Poland of our dreams". Millions of Poles had hoped to watch the Union's congress on TV but a dispute between the government and the union over editorial control led to a TV blackout in Poland. Despite the clash over televisional coverage, the government sent its Minister of Trade for unions to appeal for an end to strikes - that is the government's solution to the food crisis. Just a few miles away in Gdansk Harbor, a ship docked with American food supplies from the Catholic relief services and more relief supplies are on the way but not enough to prevent hardships this winter. John Cochrane. NBC News, Gdansk.

Egypt's president, Anwar Sadat has hit out against two of the country's most powerful figures at the climax of his 4 day purge of political opposition. He has sacked the head of the Coptic Christian Church and arrested Hassanein Heikal, the Arab's world most noted journalist and newspaper editor and Sadat is threatening to get even tougher. He read the riot act to Egypt's Parliament today, telling MP's to expect no mercy in his crackdown on opponents. It is now known he's had about 1500 people arrested since the purge began in an apparent bid to crush political activity among religious groups.

In Iran, the man who supervised the government's wholesale execution of dissendents has himself died a violent death. Ayatollah Rabbani Amlashi, the revolutionary prosecutor general died today when a bomb ripped through the Tehran headquarters of the miliary command and it was announced that the country's police chief had also died of wounds suffered in that first big bomb attack a week ago.

The revelations about Canada's security service knocked out of the headlines this week by an oil pricing agreement and what not came up again today. John Starns, the former chief of the RCMP security service speaks this weekend on CTV's Question Period. And he says he told the Prime Minister not only that the RCMP had been breaking the law but that one day they would surely be caught, "he was looking for direction," he said. "I think the answer to your question is, really having been warned, that there were these problems - what did they do about it and the answer is, I'm afraid to say, is nothing".

"So you were left on your own?"

"Well, I had the whole of the security service with me but in a sense from the point of view of ministerial direction, yes, I think that is fair to say".

The Federal Government has figured out it will cost a whole lot more than first estimated to buy the F18 Hornet fighter plane. We are supposed to have eventually more than 100 Hornets and they were supposed to cost altogether $4 billion. Now the government says they will cost $5.2 billion and that increase of more than a billion is because of inflation and the reduced value of the dollar.

The government was nagged today about the economy by a banker, and a labor leader. The banker, Roland Frase, of the Royal Bank said "Canadians don't have any confidence in Pierre Trudeau's way of doing things." He said if they did, they might be prepared to endure high interest rates. The labor leader's, Dennis McDermot of the CLC said he will have no confidence in the Prime Minister until he forcefully reduced interest rates.

We have more today about unions than we do about banks. In Edmonton, 530 people at Stelco, the west's biggest steel plant went on strike today and western companies are saying that is going to cripple the construction business.

Jeanette MacDonald in Edmonton, "The steelworkers began their picketing as of 12:01 this morning and they say they are prepared for a long walkout". Because the Stelco has been doing this to us for the last six or nine years ...".

"Mentally, I'm kind of so-so, but moneywise I think we can do

it. There are lots of jobs out there, if you want them".

"The wages is the biggest"

"What are they making right now?"

"Around the average of $8.50."

"And what are they asking for?"

"We're asking for about $2 the first year and $1 for each year after that, if possible, but we'll bend".

Stelco Company officials were not available for an interview today but they did say yesterday that the strike will have a crippling effect on the west construction industry since Stelco is the only steel plant in Western Canada that supplies angle iron in reinforcement steel. Stelco is the largest steel works plant in Western Canada supplying about 60% of the market and workers said strongly today in their first day of strike that they are prepared to stay out until their contract demands are met". Jeanette MacDonald, CTV News, Edmonton.

All through central Europe people are worried, worried because of the threat of nuclear war exploding right in their own backyard which appears more and more omniscient. Ever more powerful weapons are being deployed in Europe by the superpowers and Europeans fear they will be the first victims. In Britain the nuclear arms build up has become a serious political issue.

Clark Todd reports on it: "Some American generals call Britain America's unsinkable aircraft carrier. They're probably right. There are more than 200 U.S. fighter bombers based in the U.K. at installatinos like Lincoln-Heath. Installations are scattered across the country. The debate here is over whether

these aircraft should carry nuclear weapons. Critics say all presence of nuclear weapons does is make Britain a more important target. British airbases have an antiquated air about them, some military men say that's a result of not having enough money. But many of the bases do have American personnel and American equipment and the British have a nuclear capability of their own. The critics want that dispensed with as well. The most extreme leftists favor getting rid of all nuclear weapons in Britain. Opposition to nuclear weapons and particularly American ones here is not new. What makes it a major issue now is a bid by left winger Tony Benn for the Deputy Leadership of the Opposition Labor Party. As his nightly news appearances here indicate. Benn does not shy away from this issue. "I will not be a party to a propaganda exercise to tell my children that they have the inevitability of a nuclear war with the Soviet Union".

Benn's critics say that as a member of NATO Britain must play host to American nuclear weapons. Benn says that Canada is a member of NATO and does not have American weapons on its soil. If Benn does win the Deputy Leadership of the Labor Party, that party wins the next election, this country will move radically to the left and those who believe this is America's aircraft carrier may have to find a new place for the planes. Clark Todd,, CTV News, London.

And that's the news on this Saturday night, I'm Keith Morris, from all of us at CTV news - thank you - Good night.

Appendix D

Table 1. Varimax rotated factor matrix of 22 attitudinal scales for the instructional program (Pilot Study).

SCALE	FACTOR							
	1	2	3	4	5	6	7	Communality
SINCERE	.4494	-.0166	-.0248	-0.350	.3034	-.5935	.2142	.6943
SUPERIOR	-.0180	.1020	.6434	.1450	.2191	-.3268	.1746	.6311
CONFIDENT	.0059	.1706	.8575	-.0287	.0226	.0291	-.0184	.7670
SERIOUS	.0740	-.2107	.3517	.3931	.0593	-.6382	-.1383	.7582
RELAXED	-.0182	.2084	.0395	.3987	.0582	.6736	.2060	.7039
STRONG	-.0365	.4603	.5842	-.0559	.4746	-.0331	-.0296	.7850
PERSUASIVE	.3613	.3533	.4162	-.2414	.4097	-.1346	.0712	.6780
PROFOUND	.4166	.4819	.4942	.1823	-.1339	.2729	.1382	.7949
INTERESTING	.1407	.8833	.1431	-.0315	.1208	.1867	-.1452	.8922
DEPENDABLE	.8289	.1381	-.0760	.3058	.0600	.1368	.0545	.8309
CALM	.1435	-.2126	.6610	.2268	.3247	.4393	.0823	.8595
HUMANE	.0142	.0242	.1132	.2711	.8528	-.1222	-.0022	.8294
WARM	.1100	.1164	.2573	.3758	.4806	.2111	.5756	.8400
INFORMED	.8178	.1052	.1164	-.0761	-.2114	-.1853	.1160	.7918
GOOD	.1826	.8081	.1455	.0840	.1013	.2050	.3054	.8603
GENTLE	.0719	-.0372	-.0543	.8556	.1086	.0252	.0007	.7541
HONEST	.1512	.0925	.0337	.0416	.0062	.0064	.9063	.8558
RELIABLE	-.1930	.6095	-.0053	.4873	.0438	-.0501	.2140	.6965
PLEASANT	.2110	.3599	.3298	-.0297	.6577	.3024	.1753	.8385
CAUTIOUS	.2588	.1777	.2002	.7781	.1018	.0577	.1238	.7716
FRIENDLY	.7925	-.0578	.0438	.1407	.3779	.0121	.0762	.8020
NOT NERVOUS	.4091	.2408	.1113	-.0037	.1976	.5154	-.0513	.5451
EIGENVALUE	6.34	2.48	2.26	2.12	1.40	1.25	1.10	
% VARIANCE	28.80	11.30	10.30	9.70	6.40	5.70	5.0	

Table 2. Varimax rotated factor matrix of 22 attitudinal scales for the informational program (Pilot Study).

SCALE	FACTOR							
	1	2	3	4	5	6	7	Communality
SINCERE	.0635	.1156	.0292	.1643	.0471	.9192	-.0198	.8814
SUPERIOR	-.1365	-.1863	-.2361	.5866	.3278	-.1146	.2509	.6369
CONFIDENT	.2772	.0246	.5506	.1569	-.1615	.1230	-.6078	.8160
SERIOUS	-.2471	.2098	.0195	.0520	-.6436	-.2842	.0228	.6037
RELAXED	.6992	-.0498	.2530	.1037	.3052	.0428	.0392	.6626
STRONG	-.0244	-.1951	-.8644	.2592	-.0908	.0370	.0176	.8631
PERSUASIVE	-.1310	.0400	-.0615	.7401	.1364	.0817	-.2371	.6519
PROFOUND	-.0073	.2923	-.1039	.6720	-.3264	.2429	.2043	.7554
INTERESTING	-.1291	.7268	-.0030	.1955	-.0736	-.3375	.0782	.7087
DEPENDABLE	.3380	.6258	.2625	.2066	.0257	.2045	.1936	.6975
CALM	.7432	.1446	.1714	-.0849	-.1072	.3841	.0110	.7691
HUMANE	.7840	.0870	.2117	-.1378	-.0466	.0003	-.0551	.6913
WARM	.6419	.1431	-.2265	-.1302	.2750	.1324	-.3979	.7524
INFORMED	-.0477	.7920	-.0111	-.2036	.0968	.2302	-.1107	.7458
GOOD	.1350	.1691	.0725	.1681	.7919	-.1387	.2166	.7737
GENTLE	.7856	-.1005	.0110	-.0342	.0715	-.0867	.4084	.8080
HONEST	.1766	.7707	.1196	.0353	-.0728	.0590	.0495	.6520
RELIABLE	-.1444	.3587	.2646	.0663	.2541	.0758	.6154	.6731
PLEASANT	.8080	.2342	.1149	-.0425	.2342	-.1195	-.2269	.8434
CAUTIOUS	.6456	-.3577	.1018	.0839	.0035	-.1614	-.1775	.6198
FRIENDLY	.8038	.0906	-.0061	-.1432	.0567	.2293	-.1436	.7514
NOT NERVOUS	.4387	.0138	.7562	-.0782	.0079	.0583	.1639	.8010
EIGENVALUE	5.75	2.99	2.06	1.74	1.34	1.21	1.04	
% VARIANCE	26.10	13.60	9.40	7.90	6.10	5.50	4.80	

Appendix B

IMPRESSION SHEET

Hand Unit No. _____

Name: _____ Sex: _____

Age: _____ Grade XI average _____

Please indicate below your impression of the videotape you have just seen.

Complete each scale separately and circle the number on the scale which most accurately reflects your impression of the videotape.

For example, if you thought it was 'Quite Clear' on the scale below, you would circle number 2:

Clear	1	(2)	3	4	5	6	7	Unclear
	Very	Quite	Moderately	Can't	Moderately	Quite	Very	

Note: The other scales below are not written out in full, but the numbers in each case represent the same graded steps.

Insincere	1	2	3	4	5	6	7	Sincere
Superior	1	2	3	4	5	6	7	Inferior
Confident	1	2	3	4	5	6	7	Unsure
Serious	1	2	3	4	5	6	7	Humorous
Tense	1	2	3	4	5	6	7	Relaxed
Strong	1	2	3	4	5	6	7	Weak
Unpersuasive	1	2	3	4	5	6	7	Persuasive
Shallow	1	2	3	4	5	6	7	Profound
Interesting	1	2	3	4	5	6	7	Uninteresting
Undependable	1	2	3	4	5	6	7	Dependable
Agitated	1	2	3	4	5	6	7	Calm
Humane	1	2	3	4	5	6	7	Ruthless

Cold	1	2	3	4	5	6	7	Warm
Uninformed	1	2	3	4	5	6	7	Informed
Good	1	2	3	4	5	6	7	Bad
Gentle	1	2	3	4	5	6	7	Aggressive
Dishonest	1	2	3	4	5	6	7	Honest
Reliable	1	2	3	4	5	6	7	Unreliable
Unpleasant	1	2	3	4	5	6	7	Pleasant
Rash	1	2	3	4	5	6	7	Cautious
Unfriendly	1	2	3	4	5	6	7	Friendly
Not nervous	1	2	3	4	5	6	7	Nervous

How effective do you think this method of evaluation is?

Effective 1 2 3 4 5 6 7 Ineffective

Thank you

Appendix F

Hand Unit # ____

How effective do you think this method of evaluation is?
Effective 1 2 3 4 5 6 7 Ineffective

Appendix G

Achievement Test
for
Study I

Check the most appropriate answer to each of the following questions (check only one alternative per question).

1. Which of the following is an example of recall?

   a) producing on request the name of someone you met years ago
   b) realizing that you know someone when you pass her on the street
   c) taking only 5 trials to learn a list of words that you learned initially last week in 20 trials
   d) looking at a picture of someone and realizing that you know him

2. The least sensitive measure of memory is

   a) recognition
   b) recall
   c) saving
   d) overlearning

3. Free call refers to
   a) recalling learned items in the order they were learned
   b) recalling learned items in the reverse order they were learned
   c) recalling learned items in any order
   d) a technique for refreshing an individual's memory of forgotten information

4. Miller estimated the average memory span to be ___ items.

   a) 5
   b) 7
   c) 12
   d) 15

5. Which method is most likely to pick up evidence of prior learning?

   a) recognition
   b) recall
   c) savings
   d) inhibition

6. Recognition is demonstrated by

   a) knowing the facts necessary to answer an essay question
   b) relearning American History
   c) overlearning foreign vocabulary words
   d) correctly answering a multiple-choice question

7. Which of the following statements is true?

   a) Almost all of what enters the sensory register is selected and passed onto the next level of memory
   b) the level of memory next to the sensory register is long-

term memory.
c) the sensory register has a longer duration than short-term memory
d) the sensory register stores information at the level of the senses.

8. Relearning a musical piece that you had learned ten years earlier but have forgotten in the meantime would probably utilize

a) savings
b) recognition
c) paired associates
d) rote rehearsal

9. Which is true of short-term memroy?

a) it has a very large capacity for material
b) material in short-term memory will disappear in 10 to 20 seconds
c) it is less selective than the sensory register
d) it is permanent and unconscious

10. Which is not one of the three levels of memory?

a) sensory register
b) primary memory
c) short-term memory
d) long-term memory

11. Chunking is a process used to

a) organize long-term memories
b) store short-term memories
c) retain long-term memories
d) retrieve information from the sensory register

12. The technique that helps us to retain information in short-term memory is called

a) cueing
b) inhibition
c) rehearsal
d) recognition

13. Reciting the alphabet from A to Z is an example of

a) free recall
b) recognition
c) serial recall
d) savings

14. Retention time in the sensory register

a) is relatively long
b) generally lasts no more than several seconds
c) generally lasts no more than ten minutes
d) may last as long as a day

15. The level of memory that stores an exact representation of information to be retained is

a) short-term memory
b) long-term memory
c) sensory register
d) savings

16. Our perception of a passing automobile would be temporarily stored in

a) the sensory register
b) short-term memory
c) long-term memory
d) the hippocampus

Thank you.

Appendix B

Table 1. Full factor matrix with associated eigenvalues and communalities of the 22 attitude scales for condition 1 (Study 1).

SCALE	FACTOR								
	1	2	3	4	5	6	7	8	COMMUNALITY
SINCERE	.1103	-.0090	-.0489	.0296	.0619	.1376	.8666	-.0154	.7895
SUPERIOR	.2878	-.1283	.6215	-.1056	.3478	.0001	-.0155	.0279	.6186
CONFIDENT	.4948	-.0776	.5686	.2607	-.1510	.2995	.0373	-.1021	.7664
SERIOUS	-.0030	.1828	.0596	.4334	.0798	.0365	.1482	.5952	.6088
RELAXED	-.2101	.1900	.2472	.1174	.1071	.6333	-.0239	-.0479	.5705
STRONG	.7830	.0437	-.0580	-.0384	.0550	.1647	.1106	.0107	.6623
PERSUASIVE	.6200	-.0110	.0982	.4583	.1436	-.0246	.0872	.1860	.6670
PROFOUND	.6573	.2990	-.1591	.0713	.0939	-.1500	.0792	.2011	.6298
INTERESTING	.7239	-.1230	.2995	.1094	.2092	-.0406	-.0182	-.2060	.7290
DEPENDABLE	.2611	-.0981	-.0539	.5950	.1370	.1743	.3341	-.0237	.6028
CALM	-.1324	.2201	.7244	.0744	-.0279	.3151	.0816	.1306	.7200
HUMANE	.0938	.7078	.1219	.2313	-.1614	.1469	-.0264	.0648	.6307
WARM	.4631	.4548	.2582	.0333	-.1591	-.2797	.0976	-.0028	.6022
INFORMED	.0800	.1319	.1768	.3249	.0158	.0795	.1677	.7129	.7034
GOOD	.4672	.1072	.2728	.2775	.5967	.0050	.0207	.0779	.7438
GENTLE	.0167	.5843	.0908	.2411	.5101	.1690	-.0191	.2655	.7676
HONEST	-.0113	.7079	-.0909	.0255	.2034	.2139	.1588	-.1497	.6448
RELIABLE	.1026	-.0006	-.0223	.2143	.8105	.1507	.1439	-.1192	.7714
PLEASANT	.2742	.3172	.3492	.1322	.1805	-.2943	.5670	.0777	.7619
CAUTIOUS	.0557	.1681	.1063	.8053	.1121	-.0866	-.0226	.0462	.7138
FRIENDLY	-.1003	.1974	.5030	.2663	-.0101	-.1656	.5588	.1195	.7270
NOT NERVOUS	.2088	.1505	.0460	-.0882	.0983	.8094	.0585	.0847	.7516
EIGENVALUE	5.03	2.22	1.71	1.54	1.45	1.17	1.05	1.01	11.26
% VARIANCE	22.90	10.10	7.80	7.00	6.60	5.30	4.80	4.60	

Table 2. Full factor matrix with associated eigenvalues and communalities of the 22 attitude scales for condition 2 (Study 1).

SCALE	FACTOR							
	1	2	3	4	5	6	7	COMMUNALITY
SINCERE	.0620	.0503	.6284	.0560	-.1261	.2557	-.2965	.5737
SUPERIOR	.5401	.0941	.0502	.3985	-.2858	.3514	.1892	.7028
CONFIDENT	.6665	-.0720	.0993	.2664	.1605	-.2968	.1350	.6623
SERIOUS	.0953	.1005	.0449	.0566	-.1972	-.7255	.1837	.6234
RELAXED	-.0790	.0139	.2727	.8072	.0409	-.1518	-.0907	.7653
STRONG	.7899	.1917	.0300	-.0685	.0660	-.1806	-.0745	.7088
PERSUASIVE	.0903	.7415	.2509	.0352	.0429	-.2146	-.2219	.7192
PROFOUND	.2696	.2043	-.0628	.2119	.1884	-.0566	-.6379	.6089
INTERESTING	.5678	.5642	.0175	-.0698	.0445	.2151	-.0339	.6953
DEPENDABLE	.1581	.7772	-.0105	.1510	-.1091	.1413	.0731	.6892
CALM	.2153	.0579	-.2627	.2593	.6829	.2653	.1495	.7451
HUMANE	.1128	-.0138	.5654	.0032	.3467	.2828	.2028	.5739
WARM	.0804	-.1175	.1259	.0339	.7639	.0661	-.1203	.6896
INFORMED	.4814	.3914	-.0297	-.1145	.2166	-.3354	-.1807	.5911
GOOD	.5605	.5135	.1624	.1935	.0233	.3029	.1535	.7575
GENTLE	-.0657	.2060	.3653	-.0646	.0868	.6002	.0406	.5538
HONEST	.1111	.1076	.7873	.1085	.0067	-.1534	.1823	.7122
RELIABLE	.2962	.4121	-.1985	.3940	-.0705	-.2264	.3811	.6537
PLEASANT	.5117	.2106	.2975	.3313	.1689	.2194	.1326	.5987
CAUTIOUS	.2651	.0695	.0876	-.0228	.1654	-.1314	.6210	.5135
FRIENDLY	-.0674	.4116	.4055	.1552	.5318	-.0226	.2695	.7184
NOT NERVOUS	.2239	.1508	-.0861	.7006	.2488	.0589	-.1455	.6577
EIGENVALUE	5.04	2.31	1.72	1.59	1.41	1.33	1.07	9.28
% VARIANCE	22.90	10.50	7.80	7.20	6.40	6.00	4.90	

Table 3. Full factor matrix with associated eigenvalues and communalities of the 22 attitude scales for males in condition 1 (Study 1).

SCALE	FACTOR							COMMUNALITY
	1	2	3	4	5	6	7	
SINCERE	.2099	.7186	.3830	.0094	-.3011	.0506	-.0391	.8019
SUPERIOR	.1641	.2460	.1723	.1149	.1633	.2444	-.6169	.5961
CONFIDENT	.7941	.1461	-.1168	.3395	.0669	.1304	-.0287	.8032
SERIOUS	.3246	.3155	.3116	-.2608	.0663	.0296	.6732	.8285
RELAXED	.1147	-.0733	.1076	-.0109	.9039	.0357	-.0121	.8486
STRONG	.3449	-.0782	.5656	.3075	.0028	.3940	-.1112	.7071
PERSUASIVE	.8118	.0371	.2213	.1754	.0166	.0333	-.0778	.7476
PROFOUND	.3158	-.1072	.4082	.5229	-.1559	.1821	.0843	.6159
INTERESTING	.6476	.1791	.3303	.0504	-.0934	.3629	.0456	.7056
DEPENDABLE	.6988	.2823	.2415	.0628	.1098	-.0922	.1189	.6650
CALM	.1144	.6008	-.2671	.0731	.5162	.3930	-.1048	.8826
HUMANE	.1345	.1833	-.2929	.5033	.1259	.2589	.5285	.7530
WARM	.2357	.2000	.0143	.6675	.1022	.0433	-.0126	.5538
INFORMED	.0835	.2128	.2100	.7361	.0344	-.1371	-.1257	.6739
GOOD	.2297	.1540	.8112	.3269	.0465	-.0129	-.0228	.8442
GENTLE	-.4703	-.0078	.2964	.3231	.4255	.4484	-.0333	.7967
HONEST	-.0753	-.0614	.1142	.1924	.5089	.2009	.5183	.6274
RELIABLE	.0430	.2659	.7461	-.0889	.1600	-.0188	.0271	.6639
PLEASANT	.2337	.8289	.2689	.2006	.0075	-.0197	-.0127	.8548
CAUTIOUS	.5003	.2063	.0128	.1994	.3089	-.5340	.0759	.7191
FRIENDLY	.0667	.8309	-.0014	.2207	.0108	-.1917	.0571	.7836
NOT NERVOUS	.1669	-.0472	.0258	.0119	.1863	.7933	.0304	.6958
EIGENVALUE	5.89	2.42	2.00	1.78	1.55	1.34	1.19	12.06
% VARIANCE	26.80	11.00	9.10	8.10	7.00	6.10	5.40	

Table 4. Full factor matrix with associated eigenvalues and communalities of the 22 attitude scales for females in condition 1 (Study 1).

SCALE	FACTOR								
	1	2	3	4	5	6	7	8	COMMUNALITY
SINCERE	.3092	-.0282	.0377	.1354	.0126	.0595	.9285	.0175	.8882
SUPERIOR	.1293	7596	.0155	.0022	-.0626	-.0626	.0312	.3060	.6925
CONFIDENT	-.2207	.7272	.0587	.4210	.1247	.1247	.0419	.2190	.8656
SERIOUS	.1056	.1056	-.0340	-.0043	.1100	.1100	.0390	.7564	.6180
RELAXED	-.0195	-.0073	-.1646	.8462	-.542	-.1542	.1598	.0642	.7991
STRONG	-.2907	.2179	.5103	-.0671	.6926	.6926	-.0630	.0276	.8873
PERSUASIVE	.4321	.4261	.3366	-.3301	.2771	.2771	.0443	-.1158	.7227
PROFOUND	.1158	.1551	.7106	-.2031	.1056	.1056	.0535	-.2814	.6782
INTERESTING	-.1058	.8024	.2920	-.2383	.0391	.0391	-.1157	-.1908	.8546
DEPENDABLE	.3187	.0033	-.1124	-.0089	.6915	.6915	.0864	.1091	.6317
CALM	.0620	.1723	-.0453	.2726	-.1679	-.1697	-.1694	.2232	.7948
HUMANE	.4586	-.1862	.2986	.3957	.1528	.1528	.0232	.0003	.5695
WARM	.0557	.1637	.7917	.0241	-.1010	-.1010	.0466	.2577	.7652
INFORMED	.1067	.0090	-.1174	-.1045	-.0218	-.0218	.2096	-.0406	.8508
GOOD	.4637	.6933	.1555	.1505	.1481	.1481	-.1678	-.0708	.8455
GENTLE	.7764	.0615	.2408	.0556	-.0272	-.0272	.1443	.0388	.6932
HONEST	.5435	-.1070	.2614	.0807	-.0410	-.0410	.5597	.0388	.7389
RELIABLE	.5371	.4373	-.2984	.1744	.2109	.2109	.1896	-.2334	.7849
PLEASANT	.3223	.0168	.7995	-.0137	.0245	.0245	.0607	-.0458	.7519
CAUTIOUS	.6615	.1188	.0252	-.0265	.3897	.3897	-.0782	.3010	.7094
FRIENDLY	.3955	.0881	.3258	.4719	-.2752	-.2752	-.1515	.2268	.6447
NOT NERVOUS	.2084	.1367	-.1461	.6916	.3220	.3220	.1348	-.3461	.8365
EIGENVALUE	4.62	2.92	2.35	1.77	1.54	1.27	1.12	1.03	12.74
% VARIANCE	21.00	13.30	10.70	8.00	7.00	5.80	5.10	4.70	

Table 5. Full factor matrix with associated eigenvalues and communalities of the 22 attitude scales for males in condition 2 (Study 1).

SCALE	FACTOR								
	1	2	3	4	5	6	7	8	COMMUNALITY
SINCERE	.5389	.3468	.1989	-.1329	.1688	-.2873	.0501		.5815
SUPERIOR	.4705	-.0854	.6394	-.0344	.0694	-.0970	.0879		.6606
CONFIDENT	.1692	-.1958	.3699	.0820	.5783	.3237	.0352		.6510
SERIOUS	-.1244	.0146	-.0235	-.1709	.2407	.7048	.0068		.6002
RELAXED	.2848	-.0610	.5798	-.0341	-.1083	.3217	-.4141		.7088
STRONG	-.0439	.2615	.1339	-.0183	.8078	.1441	.1325		.7794
PERSUASIVE	.1353	.7183	-.0480	-.0340	.0890	.1509	-.4222		.7466
PROFOUND	-.4607	.4545	.4977	-.0265	-.0433	-.1110	-.2348		.7365
INTERESTING	.0460	.7060	.0199	.0596	.3326	-.1818	.1406		.6678
DEPENDABLE	.1031	.7618	.0877	.0075	-.0672	.1822	.2856		.7181
CALM	-.0705	-.0353	.1672	.8278	-.0032	.0368	.3116		.8179
HUMANE	.7942	.0384	.1717	.1912	.0516	-.0795	.1047		.7182
WARM	.0519	.0059	.1178	.8338	.2140	-.1677	-.0640		.7898
INFORMED	.0714	.2409	-.1746	.2040	.7004	.1048	-.3580		.7649
GOOD	.3758	.5468	.2809	.2489	.2346	.0140	-.0507		.6389
GENTLE	.5096	.1319	.1057	.2835	-.2781	-.3033	.1384		.5571
HONEST	.6778	.1491	.0905	-.1637	.0651	.3417	-.0285		.6384
RELIABLE	.0654	.0806	.1515	.1102	.0730	.7872	.1468		.6925
PLEASANT	.2574	.2421	.6028	.1926	.2567	-.1168	.2434		.6641
CAUTIOUS	.2558	.1170	-.0861	.1554	-.0310	.2468	.7595		.7495
FRIENDLY	.4808	.2915	-.0429	.5885	-.1415	.2093	-.1028		.7388
NOT NERVOUS	-.0074	.1277	.7011	.2367	.0369	.1865	-.0856		.6075
EIGENVALUE	4.73	2.47	2.01	1.84	1.71	1.29	1.18		10.65
% VARIANCE	21.50	11.20	9.10	8.40	7.80	5.90	5.40		

Table 6. Full factor matrix with associated eigenvalues and communalities of the 22 attitude scales for females in condition 2 (Study 1).

SCALE	FACTOR 1	2	3	4	5	6	7	8	COMMUNALITY
SINCERE	-.1449	-.0026	-.1265	.0824	-.0333	.8392	.0125		.7494
SUPERIOR	.8409	-.1723	.1317	-.0671	.0768	-.1067	-.0239		.7765
CONFIDENT	.3645	.1826	.6804	.1289	.3220	-.1322	-.0830		.7737
SERIOUS	.0146	.0888	.0900	-.1240	-.0048	-.1276	-.8632		.7929
RELAXED	-.0894	.1272	.1829	.8503	.0756	.1212	-.0599		.7982
STRONG	.5850	.2083	.4022	-.0454	.0957	-.1258	.3113		.6713
PERSUASIVE	.3919	.3846	.2218	.1301	.2696	.2390	-.2494		.5596
PROFOUND	.1233	.0820	.0895	.1113	.8597	.1329	.0698		.8039
INTERESTING	.8321	.3816	.0111	.0734	.1103	-.1998	.1317		.9130
DEPENDABLE	.7165	-.0106	-.0647	.2168	.1383	.3292	-.1320		.7096
CALM	.1944	.1793	-.0618	.4160	.5607	-.3994	.4102		.8889
HUMANE	-.1685	.7075	-.1781	-.2231	.3080	-.2024	.3030		.8382
WARM	-.4556	.0089	.5296	.2193	.2527	.3244	.2862		.7873
INFORMED	.5798	-.0908	.1174	-.0470	.6167	-.0717	-.3644		.8787
GOOD	.8830	.2635	.1804	.0795	-.0141	-.0406	.1667		.9176
GENTLE	.2138	.1620	-.1266	-.2799	.2120	.6699	.4251		.8407
HONEST	-.0344	.7847	.2713	.0003	-.0946	.3080	.0490		.7959
RELIABLE	.8477	-.2071	.0971	.1475	.2213	.0318	-.1711		.8719
PLEASANT	.5588	.5761	.1277	.2686	-.0238	-.0600	.0163		.7369
CAUTIOUS	.1971	.0246	.8788	.0410	-.0919	-.1701	-.1799		.8832
FRIENDLY	.1162	.7895	-.0080	.3003	.0658	-.0600	-.2805		.8136
NOT NERVOUS	.3094	.0446	-.0381	.7609	.1025	-.1400	.2388		.7652
EIGENVALUE	6.47	2.73	2.06	1.83	1.77	1.40	1.31		14.17
% VARIANCE	29.40	12.40	9.40	8.30	8.00	6.40	5.90		

Appendix I

Table 1. Full factor matrix with associated eigenvalues and communalities of the 22 attitude scales for condition 1 (Study 2).

SCALE	FACTOR									
	1	2	3	4	5	6	7	8	9	COMMUNALITY
SINCERE	.6983	-.0221	.2195	-.1273	.0749	.0554	.0807	.0123	-.0205	.5683
SUPERIOR	.1551	.7630	-.0664	.0469	.0168	-.1569	.3475	-.0297	.0599	.7629
CONFIDENT	.2663	.6793	-.0175	-.3055	.1165	.2286	.0345	-.0478	.1459	.7167
SERIOUS	-.0951	.4490	.0652	-.5307	-.2565	.0867	.1756	.3246	-.2084	.7494
RELAXED	.2032	.0551	-.1947	.3345	.1970	.3982	.1822	-.4125	-.1187	.6090
STRONG	-.1088	.6573	.2550	-.1863	.1430	-.3170	-.0709	.1175	-.1056	.6938
PERSUASIVE	.4911	-.2509	.1330	-.2422	.0091	.1193	.1740	.5105	.1234	.7009
PROFOUND	-.1244	.0901	.0169	.0137	.0837	-.0590	-.0057	.8559	-.0290	.7676
INTERESTING	-.0626	-.0072	-.0896	-.0010	.9119	.0851	.0393	.0745	.0627	.8616
DEPENDABLE	.2651	.0860	.3980	.4205	-.2577	-.3055	.4562	.0027	-.0791	.7870
CALM	.0616	-.0217	-.0195	-.0327	.2461	.0318	.0883	.0009	.8442	.7877
HUMANE	-.1694	.3556	-.1592	.3284	-.1818	.4057	-.0574	.1462	.5531	.8165
WARM	.0894	-.1864	-.0198	.7699	.0773	.1940	-.1489	-.0200	-.0097	.7014
INFORMED	.1330	.0745	.6620	-.2118	-.1677	-.0774	.1773	-.0348	.3635	.7053
GOOD	.2194	.3319	.0630	.2408	.5816	-.0199	.0124	-.0555	.2435	.6211
GENTLE	.0488	-.1286	-.0012	.0688	.0663	.8867	.0534	-.0211	.0775	.8236
HONEST	.1380	.3276	.2591	.0795	-.1925	.1819	.5512	.3301	.1697	.7116
RELIABLE	-.0194	.0981	-.0941	-.2460	.1477	.0629	.8222	-.0569	.0489	.7868
PLEASANT	.7020	.0729	-.3543	.2243	-.0146	-.0979	-.1381	-.2412	.1488	.7830
CAUTIOUS	.0202	-.0008	.8401	.1668	.0453	-.0086	-.1171	.1190	-.2249	.8145
FRIENDLY	.7684	.1128	-.1212	.2345	-.0028	-.1013	.0942	.0228	-.0255	.6932
NOT NERVOUS	.6225	.1820	.2655	.0265	-.0287	.2518	-.0364	-.1144	.0079	.5706
EIGENVALUE	3.30	2.89	2.18	1.67	1.46	1.36	1.10	1.09	1.02	12.65
% VARIANCE	15.00	13.20	9.90	7.60	6.60	6.20	5.00	4.80	4.60	

Table 2. Full factor matrix with associated eigenvalues and communalities of the 22 attitude scales for condition 2 (Study 2).

SCALE	FACTOR								
	1	2	3	4	5	6	7	8	COMMUNALITY
SINCERE	.0816	.6877	.2188	-.2722	.1332	-.2026	-.0699	.0277	.6659
SUPERIOR	.1169	.0343	.4968	-.2317	.5865	-.2313	-.0615	-.0477	.7189
CONFIDENT	.3307	.6347	.0141	.1596	.0350	.2475	.0816	-.3446	.7258
SERIOUS	-.0095	.0492	.0483	.0675	.1065	-.0041	.9225	-.0674	.8763
RELAXED	.7530	-.0933	-.2050	-.0234	.2424	.0341	-.1852	-.0633	.7166
STRONG	.2227	.2204	.7056	-.2390	-.0212	.2469	.1413	-.1663	.7621
PERSUASIVE	.0382	.2127	.3043	.7635	.0137	.0474	-.1519	-.1271	.7639
PROFOUND	-.0376	.6825	.0863	-.1413	-.0563	.1224	.3569	.2492	.7022
INTERESTING	-.1953	.0154	.8600	.0939	.1152	-.0753	-.0088	.1770	.8372
DEPENDABLE	.2235	.4895	-.0594	.1201	.2139	.5955	.0387	-.1469	.7310
CALM	.8349	.1751	-.1027	-.0117	-.0333	.1251	-.0691	-.0021	.7599
HUMANE	.7142	.1665	-.0998	.0022	.1120	.1175	.3553	.0039	.7004
WARM	.8242	-.0883	.2768	.1453	-.0251	-.0904	.1497	-.0069	.8160
INFORMED	.0551	.3230	-.0115	-.0528	.7473	-.0649	.2442	.0072	.7327
GOOD	.5259	.2090	.3261	.0137	.1518	-.0651	-.1705	-.0381	.4846
GENTLE	.2602	.2635	.1685	.7418	.0570	-.1551	-.0845	-.1604	.7759
HONEST	-.0467	-.0074	.0289	-.1837	-.0336	.8447	.0023	.0597	.7551
RELIABLE	.1939	-.0274	.0885	.2771	.7001	.3317	-.0644	.0211	.7277
PLEASANT	.6677	.4051	.0415	.1729	.0574	-.0350	-.0624	.0317	.6510
CAUTIOUS	.0160	.0495	.0360	.0109	.0067	.0180	-.0481	.9510	.9113
FRIENDLY	.4683	.3461	.0926	.3498	.3164	-.0532	-.3701	.0144	.7101
NOT NERVOUS	.2127	.6953	.0139	.2931	.2317	.1195	-.1248	.0295	.6991
EIGENVALUE	5.40	2.47	1.90	1.63	1.37	1.25	1.17	1.04	11.63
% VARIANCE	24.60	11.20	8.60	7.40	6.20	5.70	5.30	4.70	

Table 3. Full factor matrix with associated eigenvalues and communalities of the 22 attitude scales for males in condition 1 (Study 2).

SCALE	FACTOR 1	2	3	4	5	6	7	8	COMMUNALITY
SINCERE	.6927	.2410	.2784	.0781	.2104	.0459	.0078	-.0633	.6700
SUPERIOR	-.2006	.7179	.1839	.2025	.2753	.1994	-.0352	-.2564	.8131
CONFIDENT	-.0708	.0573	.8198	-.0965	-.0234	-.0141	-.1921	-.2065	.7699
SERIOUS	.0028	-.1531	-.3244	-.6934	.4794	-.1249	.1147	.0528	.8709
RELAXED	-.1111	-.0321	.6650	.2622	.1149	.3325	-.0397	-.1639	.6765
STRONG	.2425	.8160	.1029	-.0895	.0075	-.0657	-.0156	.1869	.7828
PERSUASIVE	.5271	-.2854	-.1609	.1420	.5336	-.1259	-.1967	.2965	.8325
PROFOUND	-.0329	-.0244	-.2525	-.0892	.0181	.0444	.1764	.8835	.8874
INTERESTING	-.1180	-.2293	.0728	.1256	-.2624	.8584	-.0962	.1239	.9178
DEPENDABLE	.6147	.1846	.0399	.2168	.1363	-.0897	.4140	-.3677	.7937
CALM	.1268	.1800	.2040	.0688	.0759	.1194	-.7662	-.2529	.7659
HUMANE	.5683	-.0930	.2385	.4719	.1617	-.3707	.0887	-.0153	.7828
WARM	.0161	-.1248	-.1115	.8969	.1587	.0254	.0886	-.0688	.8711
INFORMED	.7094	-.1381	-.0308	-.1176	-.0008	-.1428	-.1461	-.0720	.5841
GOOD	-.2900	.6099	.3383	-.1009	-.0806	.3427	-.3286	.0059	.8127
GENTLE	.0095	-.7064	.3736	.1404	.3579	-.0612	-.0605	.1187	.8080
HONEST	.0263	.0881	.0924	.0293	.8873	-.1544	.0113	-.0601	.8327
RELIABLE	-.0258	-.3518	.0874	-.4061	.3791	.5477	.1434	-.3468	.8815
PLEASANT	.0989	.5561	.6355	.1362	.0992	.0014	.0922	-.1694	.7885
CAUTIOUS	.6830	-.0708	-.2157	.0718	-.1433	-.1271	.3342	.3327	.7822
FRIENDLY	.3066	.2801	.3242	.3308	.1868	.2330	.5849	-.1098	.8305
NOT NERVOUS	.4765	.0635	.6190	-.2058	-.1413	-.2314	.3522	.1586	.8793
EIGENVALUE	4.27	3.39	2.50	2.04	1.56	1.48	1.29	1.11	14.26
% VARIANCE	19.40	15.40	11.30	9.30	7.10	6.70	5.80	5.10	

Table 4. Full factor matrix with associated eigenvalues and communalities of the 22 attitude scales for females in condition 1 (Study 2).

SCALE	FACTOR 1	2	3	4	5	6	7	8	COMMUNALITY
SINCERE	-.0748	.3372	-.1505	-.1110	.1049	.4501	.4942	.0796	.6185
SUPERIOR	.7271	.2381	-.0975	-.0652	.4327	.0003	-.1072	.0622	.8018
CONFIDENT	.8030	.1973	.1534	.1654	-.1609	-.1272	.1555	.1353	.8192
SERIOUS	.7501	-.1596	-.0451	-.2920	-.0323	-.1180	.1470	-.1459	.7333
RELAXED	-.2723	.0695	-.1852	.0296	.0656	.7408	-.1508	-.1475	.7118
STRONG	.7380	-.4411	-.0579	.1271	-.0406	-.1446	-.0385	.1260	.7985
PERSUASIVE	.0579	.3398	.0240	.0900	-.0734	-.1689	.7879	-.0021	.7821
PROFOUND	.1680	-.2959	.3985	-.1858	.3230	.0275	.5113	.1193	.6898
INTERESTING	-.1138	-.1959	.1772	.1757	-.3381	.0900	.1617	.7735	.8604
DEPENDABLE	-.0988	.0328	-.0130	.1849	.9016	-.0852	.0201	-.0612	.8695
CALM	-.1844	.0744	.8464	-.0612	-.0517	-.1393	.1319	.1898	.8352
HUMANE	.2088	.0159	.8660	.0285	.0360	.2267	-.1278	.0278	.8644
WARM	-.4281	.2494	.0568	.5360	-.0884	.2043	-.3218	.0274	.6899
INFORMED	.3879	.1302	.5027	.2975	.2595	-.2518	.1521	-.1188	.6766
GOOD	-.0246	.3134	.1535	.7134	.1864	.1686	.2538	.2263	.8101
GENTLE	-.0940	-.0090	.2693	.0945	-.2408	.8058	.0188	.1324	.8155
HONEST	.4432	-.0382	.2668	.3223	.5218	-.0218	.3834	-.0047	.7928
RELIABLE	.3736	.1566	.0693	-.1988	.3729	-.1106	-.1187	.6933	.8545
PLEASANT	-.3292	.7442	-.0046	-.2010	-.0653	.1672	.0372	-.1386	.7554
CAUTIOUS	.0756	-.2438	-.1184	.8198	.1293	-.0799	-.0697	-.1143	.7922
FRIENDLY	.0672	.8394	.0092	-.0182	-.0279	-.0156	.1592	.0087	.7360
NOT NERVOUS	.1057	.7257	.1054	.2925	.1899	-.0015	.0616	.0565	.6776
EIGENVALUE	4.37	3.30	2.22	2.07	1.42	1.33	1.24	1.03	13.22
% VARIANCE	19.90	15.00	10.10	9.40	6.50	6.00	5.60	4.70	

Table 5. Full factor matrix with associated eigenvalues and communalities of the 22 attitude scales for males in condition 2 (Study 2).

SCALE	FACTOR								
	1	2	3	4	5	6	7	8	COMMUNALITY
SINCERE	.1296	.1142	.4079	.6853	.1362	-.0182	.1293	.2410	.7596
SUPERIOR	.0763	-.2324	.7559	.0649	.2234	.2600	-.0731	.1755	.7890
CONFIDENT	.4825	.4586	-.1265	.4055	-.1530	-.0238	.2240	-.0830	.7046
SERIOUS	.0781	.0646	-.1383	.1557	.2504	.2936	.7479	-.1497	.7843
RELAXED	.6626	.3576	.0372	-.1193	-.1270	.2668	-.2300	-.1226	.7378
STRONG	.2072	.1475	.1220	.4514	.6586	.1678	.1772	-.1906	.8130
PERSUASIVE	-.0924	-.0579	.7526	.3823	.0427	-.0300	-.1261	-.2530	.8071
PROFOUND	-.0602	.0403	-.0013	.8406	.1063	.1368	-.0049	.1177	.7557
INTERESTING	-.2196	-.0475	.0602	.0887	.8510	-.1247	.1381	.2640	.8905
DEPENDABLE	.2500	.7532	-.1492	.3774	-.1910	.0211	.1896	.0279	.8681
CALM	.8471	.1930	-.0784	.1872	-.2072	.0171	.1283	.0378	.8571
HUMANE	.7991	.2025	.0959	.0250	-.0954	-.0463	-.0589	.0709	.7092
WARM	.7912	-.0802	-.0176	-.1176	.2607	-.0019	-.0600	-.1387	.7374
INFORMED	.0536	.0995	.2305	.0978	-.0956	.9004	.1238	.0598	.9143
GOOD	.4921	.0457	.5380	-.1392	.4425	-.109,	.0628	-.0572	.7679
GENTLE	.3758	-.1967	-.6597	.0614	.2091	-.1376	-.3458	-.2647	.8712
HONEST	-.0059	.7812	-.0292	.2480	.0491	.2695	-.3493	-.1700	.8987
RELIABLE	.2032	.8066	.0597	-.2788	.1536	-.0553	.0775	.0328	.8070
PLEASANT	.6874	-.0278	-.2583	.1111	.1496	.4583	.0423	.0879	.7944
CAUTIOUS	-.0563	-.0972	.0827	.1710	.0847	.0435	-.1681	.8937	.8846
FRIENDLY	.4174	.1325	-.2531	.0816	-.0143	.3907	-.6110	.1354	.8070
NOT NERVOUS	.4290	.3495	-.3293	.1869	.1078	.1471	.0319	.3679	.6191
EIGENVALUE	5.30	3.15	2.16	1.75	1.68	1.27	1.17	1.09	14.16
% VARIANCE	24.10	14.30	9.80	8.00	7.70	5.80	5.30	5.00	

Table 6. Full factor matrix with associated eigenvalues and communalities of the 22 attitude scales for females in condition 2 (Study 2).

SCALE	FACTOR								
	1	2	3	4	5	6	7	8	COMMUNALITY
SINCERE	.0976	.0511	.2587	.7875	.0369	.0259	.2379		.7579
SUPERIOR	.2242	.1040	.7699	.0213	.0759	.0335	.2657		.7318
CONFIDENT	.1469	.6422	.0633	.3227	.1417	.1605	.4601		.7997
SERIOUS	.1356	.1441	.0506	.0775	.1278	.9198	.0593		.9136
RELAXED	.8479	.1197	.0956	.1023	.1771	.0764	.1445		.8110
STRONG	.1544	.1767	.3648	.0827	.7814	.0533	.1638		.8352
PERSUASIVE	.1129	.0277	.0416	.2675	.8438	.0716	.0639		.8080
PROFOUND	.1031	.2406	.2075	.5115	.1433	.5502	.1110		.7088
INTERESTING	.0522	.0614	.8102	.0092	.3013	.1835	.0873		.7951
DEPENDABLE	.0075	.8047	.1165	.0519	.2268	.0944	.0547		.7272
CALM	.8431	.1723	.0212	.0332	.1553	.0927	.0858		.7821
HUMANE	.3760	.3849	.0132	.1134	.0954	.7007	.1553		.8268
WARM	.8061	.2056	.1830	.1836	.1195	.2607	.0669		.8460
INFORMED	.1035	.4001	.6239	.2488	.0954	.3728	.0952		.7790
GOOD	.4586	.6384	.0433	.3083	.0475	.0185	.0045		.7174
GENTLE	.1620	.6405	.4362	.2207	.4212	.0662	.0246		.8579
HONEST	.3119	.0876	.2935	.1566	.5590	.0258	.3388		.6436
RELIABLE	.1183	.2412	.6419	.2476	.2524	.0065	.4139		.7805
PLEASANT	.6077	.4117	.0602	.4349	.1160	.0037	.0152		.7452
CAUTIOUS	.1621	.0608	.0915	.1717	.0260	.0115	.7977		.7056
FRIENDLY	.5210	.5894	.3000	.2875	.1328	.2466	.1962		.9084
NOT NERVOUS	.0626	.3963	.0833	.8608	.0127	.0674	.0038		.9137
EIGENVALUE	6.32	2.57	2.27	2.23	1.76	1.24	1.01		13.86
% VARIANCE	28.70	11.70	10.30	10.10	1.00	5.60	4.60		