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Short User Manual for the PERSPACE Software System

Version 3.5

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NOTE. Version 3.5 incorporates a number of small improvements over Version 3.0, released in 1990. There is more flexibility in the prompts employed for the first two phases of the procedure: Gathering Targets and Gathering Descriptors. Most important, it is now possible to interrupt the third phase of the procedure, Gathering Ratings, and restart the procedure where it left off at a later time. This will prove very helpful in the case of large targets x descriptors matrices.

PERSPACE, a computer-controlled procedure for assessing the individual's view of his or her social world, was developed for the Program on Conscious and Unconscious Mental Processes of the John D. and Catherine T. MacArthur Foundation, directed by Mardi J. Horowitz of the Department of Psychiatry, University of California, San Francisco, and located at the Langley Porter Psychiatric Clinic. PERSPACE was created and designed by John F. Kihlstrom of the Amnesia and Cognition Unit, Department of Psychology, University of Arizona, under a subcontract from the Program; programming was by Dave Olsen at the University of Arizona, and by Randolph L. Cunningham and Paul H. DuBois of the University of Wisconsin.

Conceptual Background

A major item on the agenda of those who seek to foster the integration of personality, social, and clinical psychology is the development of techniques that can be used with individual patients to assess their social schemata -- the organized mental structures, pertaining to self and others, that guide experience, thought, and action in an interpersonal context. To this end, a number of techniques have been developed for rating protocols derived from recorded psychotherapy sessions (e.g., Horowitz, 1990). At the same time, however, it seems important to remember that rating schemes are interpretive schemes, in which some piece of experience, thought, or action is given meaning by assigning it to one category or another. In the act of interpretation, the rater's own cognitive structures are brought into play, in order to make inferences about the target's real intentions, or the actual origins of his or her action. This situation, in turn, raises the very real risk that the judge's schemata will be confused with those of the subject and that whatever interpretive scheme is applied becomes less a tool for understanding the individual and more a Procrustean bed for slotting him or her into preconceived categories.

As is well known, this sort of criticism has long been directed at insight-oriented psychotherapy and the psychodynamic theories of personality on which it is based -- one never quite knows whether it is the patient's fantasies or the therapist's that are being discussed. But it is also a criticism that has been directed against traditional psychometric theories of personality, where instances of experience, thought, or action are classified into trait categories, or construed as reasons for assigning a person to one or another personality type (Mischel, 1968). Over the last 30 years, personologists and psychotherapists of a cognitive-behavioral persuasion have argued that subjects should be allowed to speak for themselves, and that traditional psychometric or psychodynamic approaches to personality assessment have no privileged status as routes to either conscious or unconscious mental processes (see Cantor & Kihlstrom, 1987).

In the hands of traditional behaviorists, this critique of interpretation meant that subjects should keep quiet too -- that only their overt behavior was of interest, and that it should only be tabulated and cross-tabulated with objectively recorded environmental variables (Skinner, 1953). But we are a long way from that time now. Beginning with Rotter (1954) and Kelly (1955), and continuing with Bandura (1986) and especially Mischel (1968), cognitively oriented personologists and psychotherapists have argued that understanding the meanings that subjects assign to environmental events, and their own actions, are critical for understanding personality. In terms of the social intelligence view of personality (Cantor & Kihlstrom, 1987), this means that social-cognitive structures and processes lie at the heart of individual differences in experience, thought, and action, whether these are adaptive or maladaptive. Personality theories of this sort require new assessment instruments that permit people to speak for themselves, going beyond mere tabulation but stopping short of schemes that impose the investigator's interpretations on the subject or patient (e.g., Kihlstrom & Nasby, 1981; Nasby & Kihlstrom, 1986).

Assessing Personal Constructs

Since the time of George Kelly, one of the most important ideas in cognitive approaches to personality and psychopathology has been the personal construct -- the person's idiosyncratic repertoire of concepts.

Kelly developed an assessment instrument, the Role Construct Repertory Test, for assessing an individual's personal constructs. Briefly, the subject was asked to name persons who exemplified each of a broad range of social roles such as boss and rejecting person. Then three of these targets were sampled at a time, and the subject was asked to indicate some way in which two of these individuals were alike but different from the third. After eliciting a number of constructs in this manner, every target is rated on every construct. A similar procedure can be followed for social situations. By applying a number of intuitive and mathematical techniques, the investigator can determine the content of the constructs, the relations among them, and the complexity of the individual's personal construct system. Thus he or she is able to enter into the subjective social world of the subject -- begins to understand how the subject categorizes, compares, and contrasts those whom he or she encounters in the ordinary course of everyday living.

Kelly's proposal stimulated much interest, but application of his ideas was hampered by the fact that the appropriate mathematical techniques were cumbersome and expensive to apply (Bannister & Fransella, 1971; Cole & Landfield, 1977). The advent of computer technology has changed this situation somewhat, and a number of investigators have begun to finding ways of doing precisely on a computer the sorts of things that Kelly had to do roughly on paper. Among the most inventive of these investigators are Seymour Rosenberg (1977, 1986, 1988; Rosenberg & Gara, 1985; Rosenberg & Jones, 1972; Rosenberg & Sedlak, 1972a, 1972b) and Lawrence Pervin (1976, 1977, 1983), both at Rutgers.

Rosenberg's technique involves three phases. First, each subject listed at least 100 people from their lives. The subjects then prepare, for each target, a list of the physical and psychological traits thought to be characteristic of that person, and the feelings elicited in them by him or her. In addition, the subjects also freely describe three views of themselves: "me-now", me-past", and "me- ideal". A computer collates all of the person and attribute entries, and the subjects then rate each of the target persons, including the three "selves", on each of the trait and feeling attributes. The resulting two-way matrices, one for persons by traits and the other for persons by feelings, are analyzed by means of hierarchical clustering and multidimensional scaling -- multivariate techniques similar to factor analysis. Simplifying for purposes of exposition, the dimensions emerging from the scaling solution can be taken as analogous to factors, which are in turn defined by the clusters of related traits and feelings that load highly on them.

Rosenberg's analysis focused on the relations among the traits and feelings, expressed either in terms of co-occurrence or correlation. As might be expected from research on implicit personality theory (Schneider et al., 1979), certain traits and feelings were fairly consistently found to co-occur across the subjects. But other dimensions were quite idiosyncratic, appearing in one subject but not in the others. The differences between the subjects are, from a cognitive point of view, the differences between the individual's personalities. The entire set of trait co-occurrences shows, for each subject, how he or she perceives a major portion of the social world as organized, both in terms of the traits of other people and his or her own reactions to them.

Pervin (1976, 1977, 1983) employed a similar technique geared toward the assessment of situations rather than people. Subjects were first asked to list the important situations in their current lives. They were then asked to describe each situation, as well as how they felt, and their characteristic behavior, in each. The lists for each situation were collated and edited for redundancy, and then the subjects rated each situation on each attribute. The resulting matrix was factor analyzed for each subject separately, yielding the basic dimensions in the perception of interpersonal situations. Again, this procedure revealed the various dimensions that these individuals use to organize their perceptions of the situations in which they live their lives.

For the reasons outlined, above, it appears that the Rosenberg-Pervin adaptation of Kelly's Rep Test is a powerful technique of choice for tapping the content and organization of people's mental schemata for the social world. Its primary advantage is that it allows subjects to speak for themselves, without interpretation or inference on the part of the investigator. While engaged in the procedure, subjects achieve considerable insight about themselves in the course of completing the procedure. In the process of listing the people, situations, and events that are important to them, they are led to reflect on their lives in ways that may escape them in the ordinary course of everyday living. And although the descriptors provided in the subsequent feature-listing phase might (but not necessarily) come "off the top of one's head", the final target-by-feature rating phase really forces us to think about the entities in our interpersonal and intrapsychic worlds. If the mental representations elicited by this technique are not unconscious (in the strict sense of being in principle inaccessible to introspection; see Kihlstrom, 1984, 1987, 1989, 1990), then at least they may be preconscious. The simple fact that subjects are intrigued, and surprised, by what they see in the cluster analyses clearly indicate that the procedure is telling them -- and us -- something they didn't know about themselves.

An Overview of PERSPACE:
A Computer-Controlled Method for Mapping Interpersonal Space

We have developed an adaptation of the Rosenberg/Pervin technique for the purposes of assessing schemata for self and others in clinical settings. The adaptation differs from its original inspirations in two major ways. First, the general assessment strategy is applied to a wider variety of entities in interpersonal space. For example, pilot research in our laboratory is focused on the subject's self-concept, and is intended to indicate how context-specific self-concepts are organized in the mind of the person (see also Gara, 1985; Gara & Rosenberg, 1979; Rosenberg & Gara, 1985). Following the lead of Kelly and Mayman, the procedure can also be adapted to study the perceived relations among personal experiences, as represented (for example) in early memories of childhood. Second, and perhaps more important, it seems that clinical assessment should as interested in the relations among the entities as in the relations among their features. Therefore, we employ cluster analysis rather than factor analysis or multidimensional scaling to represent the perceived relations among self, others, social interactions, and the situations in which they take place.

The assessment procedure is implemented in PERSPACE, a general-purpose computer program for mapping interpersonal space (Kihlstrom & Cunningham, 1990). A preliminary version of the software, geared solely to the assessment of context-specific self-concepts (known as SITUATE, Version 1.10) was written in BASIC by Paul H. DuBois of the University of Wisconsin, to run under TRSDOS on the Radio Shack TRS80/IV microcomputer. A much-expanded program (PERSPACE, Version 2.20, 1987) was written in Turbo Pascal 3.01A by Randolph L. Cunningham, also at Wisconsin, for the IBM PC and compatibles. The most recent release of PERSPACE (Version 3.5, 1990), for the IBM PC, AT, PS/2, and compatibles, was programmed in Turbo Pascal 5.5 by Dave Olsen at the University of Arizona.

From the Subject's point of view, a complete PERSPACE assessment consists of three sessions.

Phase 1: Gathering Targets

The procedure begins by asking the subject to produce a list of targets for rating. McGuire (1984; McGuire & McGuire, 1988) has cogently argued that freely generated lists targets and descriptors reduce the potential for interference and distortion by concepts and expectancies imposed by the clinician or investigator, and thus come closest to revealing what is on the mind of the patient or subject (for a related argument, see Cantor & Kihlstrom, 1987; Kihlstrom & Cantor, 1984; Kihlstrom & Nasby, 1981; Nasby & Kihlstrom, 1986). However, there are circumstances in which specific probes might be necessary or desirable. For that reason, Version 3.5 provides both free-generation and probed-response options. The free-response probe can also be customized.

The program-supplied lists of Target probes are provided in Appendix 1. Future versions will include a wider list of probed-response targets and additional descriptor lists, as well as a custom facility.

Phase 2: Gathering Descriptors

After the targets have been listed, they are output one by one, in a random order, for feature listing. These individual attribute lists are then automatically edited for redundancy. That is, exact (case-sensitive) duplicates are removed and the resulting list is ordered alphabetically for ease of subsequent manual editing.

Phase 3: Gathering Ratings

The target and descriptor lists are collated, and every pairwise combination of target and descriptor is presented to the subject for a final rating. Alternatively, Phase 2 can be skipped and each target can be rated on an investigator-supplied rating scale. The program-supplied rating scales are provided in Appendix 2. Future versions will include a wider selection of options.

There is also a utility for preparing a custom set of investigator-supplied rating scales. The numerical rating scales themselves range from two to nine points, with a variety of options (including a custom utility) available for defining endpoints and midpoints.

As documented below, this phase of PERSPACE can consume considerable subject time. Accordingly, Phase 3 can be interrupted, and restarted at a later time.

Technical Details

The compiled version of the Program runs under MS-DOS 2.0 or higher in 256K of RAM in systems with two 360 kb diskette drives, or one 720 kb or 1.44 mb disk drive, or one diskette drive of any size and hard disk.

Copies of PERSPACE are available in 3-1/2" or 5-1/4" format from Mardi J. Horowitz at the Program on Conscious and Unconscious Mental Processes, Department of Psychiatry, University of California, San Francisco; or John F. Kihlstrom, Amnesia and Cognition Unit, Department of Psychology, University of Arizona 85721.

PERSPACE is unsupported, but the source code is available. Users who make alterations to the source code are asked to send copies to both Kihlstrom and Horowitz.

Installing the System

The PERSPACE Software System will run on IBM PC compatible machines. It requires DOS 2.0 or higher and 110 KBytes of available RAM. To install the PERSPACE Software System on a hard disk, simply copy all of the files and subdirectories on the installation disk into the desired directory. It is suggested that a separate subdirectory off the root be created to hold the system files. If the version of DOS is 3.30 or higher, one can copy the entire system with just one command, "xcopy". To do this, place the floppy disk in drive A: (or B:) and type

"xcopy a:\perspace*.* c:\perspace*.* /s"

or

"xcopy b:\perspace c:\perspace /s".

The entire system will need approximately 220 KBytes, including the manual, plus 460 KBytes (maximum) for each subject who keeps his/her data on the hard disk.

Starting Up the System

To start up the PERSPACE System Software, first change into the newly created "PERSPACE" subdirectory

"cd \perspace".

Now simply type

"perspace"

and the system will start.

Using the System

The first screen to appear displays the program title, version, and credits. This screen will last for 10 seconds or until a key is pressed.

Subject Information Entry Screen

The next screen will prompt the user for a first and last name and the drive on which to save this session's files.

If the name entered has not been entered previously (only the first character of the first name and the first 6 characters of the last name are significant), then the user is prompted to enter the various items of identifying information. This information is stored in the SUBJECT.INF file in the Subject's subdirectory on the selected drive.

For the drive, the default is to save Subject files on Drive C:. However, considerations of security -- for example, when the program is used in classroom demonstrations, or when there is some likelihood of unauthorized access to subject or client files -- operators may wish to save each person's files on separate floppy disks which can be locked away between uses, or else retained for safekeeping by the subjects themselves. Subject subdirectories created on floppy disks can be moved to hard disks, and vice-versa, merely by creating the necessary subdirectory (see above) and copying the files from one disk to the other.

If the subject's name has been entered previously (as, for example, when targets and descriptors are generated, and ratings made, in separate sessions), the program goes directly to the top-level menu for the system, permitting the user to navigate through the PERSPACE environment.

Main Menu

After the identifying information has been entered, the top-level menu for the system appears.

From this menu the user may choose to do a variety of things using a convenient menu system. The user can navigate around within the PERSPACE system by using <u>either</u> single keystrokes <u>or</u> the cursor keys followed by ENTER. The menu screens are simple and straightforward, leading down to appropriate data entry screens.

The Operator Session must be completed, at least in part, before the first Subject Session is initiated. Screen colors can be changed at any time.

After finishing with the program, quit to DOS.

The Operator Menu

First, the user goes to the Operator Menu to edit Subject information, set up the Subject sessions, and view or print the matrix of data generated by the Subject. The entire procedure described below can be done before the first Subject session; or, it can be done piecemeal, as required, at the beginning of each session.

(1) Edit Subject Information

Use the ENTER key to move through the various slots, entering new or revised information as needed. Pressing ENTER saves the existing entry. When editing is completed, PERSPACE automatically returns to the Operator Menu.

(Of course, the same information can be edited outside the PERSPACE system, by importing the SUBJECT.INF file in the Subject's subdirectory into a text-editing program and saving the results as an ASCII file.)

(2) Choose Target Prompts

In Phase 1 of the Subject Session, the Subject creates a series of targets to be described in Phase 2. The Target Prompts Selection Menu shows the available choices, as well as the current selection. To make a selection, move to your choice with the cursor keys (it will be highlighted on the screen) and press ENTER; or simply press the number of the function desired (it will be highlighted on the screen).

After making the selection, which is stored in the TARGET.INP file in the Subject's subdirectory, QUIT to the Operator Menu.

Ordinarily, Subjects will provide a free listing of targets -- whether persons, situations, or events. However, under some circumstances it may be desirable to prompt the Subject with specific categories. Version 3.5 affords five different options for the operator. Specific prompts, and references to the sources, are provided in Appendix 1A-E.

(2.6) Free Listing

When the Free Listing option is chosen, the Operator must also select a prompt. Version 3.5 offers three generic prompts -- for important persons, situations, and events -- plus a utility that permits use of a user-defined prompt.

(3) Choose Descriptor Prompts

In Phase 2 of the Subject Session, the Subject describes each of the targets generated in Phase 1. The Descriptor Prompts Selection Menu shows the available choices, as well as the current selection. Note that there is now an option or a user-defined prompt.

After making a selection, quit to the Operator Menu.

As with the target prompts, Version 3.5 does not permit the Operator to create a custom list of descriptor prompts from within the system. However, the same end may be achieved by editing one of the available lists of prompts, stored in the DESCRIPT subdirectory; or, alternatively, by editing the TARGETS.RAT file .

(4) Edit Targets

Before moving from Phase 1 to Phase 2, it may be necessary to edit the list of targets generated by the Subject. If the Subject has entered precisely the same name two or more times, the second and later instances are automatically deleted; for this reason, subjects should be encouraged to list full names, or at least middle and last initials. However, the Subject may have neglected to generate targets that may be clinically relevant; in this case, the name(s) may be added by the Operator. Or, on second thought, may feel that a particular target is inappropriate; in this case, one token may be deleted. Or, an inexact name may have been given to a target; in this case, it may be changed to make the needed identification.

After editing, quit to the Operator Menu.

Of course, the target list can be edited outside the PERSPACE system as well, by editing the TARGETS.RAT file with a word-processing program and saving the results as an ASCII file. This option may be useful in the event that the Operator wishes the Subject to respond to a customized target list of the former's own devising. However, never change the TARGETS.SUB file, as this preserves the precise targets generated by the subject, along with information concerning response latencies.

(5) Edit Subject-Generated Descriptors.

Before moving from Phase 2 to Phase 3, it may be necessary to edit the list of descriptors generated by the Subject. If the Subject has entered precisely the same descriptor two or more times, the second and later instances are automatically deleted. However, he or she may have failed to use some term that is of particular interest to the Operator; in this case, the term may be added to the list. Alternatively, the Subject may have used virtually the same descriptor, and the Operator does not wish to preserve the distinction between them; in this case, the term may be deleted or otherwise clarified.

After editing, quit to the Operator Menu.

Of course, the target list can be edited outside the PERSPACE system as well, by editing the DESCRIPT.RAT file with a word-processing program and saving the results as an ASCII file. This option may be useful in the event that the Operator wishes the Subject to respond to a descriptor list of the former's own choosing. However, never change the DESCRIPT.SUB file, as this preserves the precise descriptors generated by the subject, along with information concerning response latencies.

(6) Select Descriptor Set

For some purposes it may be desirable to eliminate Phase 2, and have the Subject rate targets on a standard set of descriptors supplied by the Operator. Version 3.5 offers 16 such sets, some of which are shorter versions of others, drawn from the current literature in personality and social psychology. The specific contents of each set, and references to the sources, are provided in Appendix 2A-P. These sets of system-supplied descriptors may be selected at any time before Phase 3.

If the subject has generated his or her own descriptors in Phase 2, these descriptors (stored in the DESCRIPT.SUB file that has been created on the Subject's subdirectory) are automatically selected, even if another, predefined set was previously selected. If an alternate set is subsequently selected, the subject-generated set is *not* lost and can be reselected at any time.

After making a selection, quit to the Operator Menu.

(7) Set Up Rating Scale

In any event, before proceeding to Phase 3 it is necessary to set up the rating scale that will be used by the Subject. Version 3.5 permits a great deal of flexibility with respect to the numerical scale (2 to 10 points) and the definition of endpoints and midpoint (if any). The screen shows the current selection. To change any aspect of the rating scale, press the appropriate key.

After completing the setup, quit to the Operator menu.

(7.1) Redefine Test End Points

Version 3.5 offers five of the most commonly used scale anchors. In addition, there is a utility that permits the Operator to define custom endpoints.

After redefining the endpoints, quit to the Rating Scale Setup Menu.

(7.2) Redefine Test Mid Points

Where the numerical scale has an odd number of points, Version 3.5 offers 11 of the most commonly used midpoint definitions (including a blank). In addition, there is a utility that permits the Operator to define a custom midpoint.

After redefining the midpoint, quit to the Rating Scale Setup Menu.

(7.3) Redefine Numeric Scale

Version 3.5 offers 17 different Likert-type scales, ranging from 0-1 and 1-2 to 0-9 and 1-9. Numbers always increase from left to right, in accordance with standard Likert-scale format.

After redefining the numeric scale, quit to the Rating Scale Setup Menu.

(8) View and/or Print Matrix

The data gathered by the subject is represented in three files stored in the Subject subdirectory: TARGETS.SUB, DESCRIPT.SUB, and RATINGS.DAT. These files, in turn, are combined into a single file, VIEW.DAT, also stored in the Subject subdirectory, which can be inspected or printed from within the system.

After viewing and/or printing, quit to the Operator Menu.

(8.1) View Matrix

To view the data, the system calls a public domain program (LIST.COM, Version 5.2) devised by Vernon D. Buerg (1984). This program retrieves the VIEW.RAT file on the Subject subdirectory, which combines the TARGETS.SUB, DESCRIPT.SUB, and RATINGS.DAT files. Use the PageUp, PageDown, and cursor control keys to view any portion of the data.

After viewing, press ESC to exit to the View and Print Matrix Menu.

(8.2) Print Matrix

The data can be printed on any printer, but laser printers are best for this purpose. It is advised to set the printer to compressed print, and perhaps landscape orientation as well, so that data is not lost off the side. Using SIDEWAYS, proprietary software (e.g., 4th Edition, Funk Software, 1987) to rotate copy 90 degrees on printers, may be necessary for dot-matrix and other non-laser printers.

The program presents a reminder to select the proper typeface and orientation.

The Subject Menu

The three phases of the assessment procedure are controlled from the Subject Menu.

When each phase is completed, a message appears thanking the subject for his or her effort, and instructing him or her to call the Operator. Pressing ENTER returns to the Main Menu.

(1) Gather Targets

Assuming that it has been set up by the Operator (Operator Menu, Items 1 and 2), the system begins data collection as soon as this option is selected. If the system has not been set up properly -- i.e., if the SUBJECT.INF, SETTINGS.INI, and TARGET.INP files do not reside in the Subject subdirectory -- a prompt will appear. Otherwise, the subject merely enters Targets in response to the prompts, until either the list of prompts or the subject is exhausted.

In principle, subjects could enter targets until the cows come home. Since Phase 2 requires subjects to generate descriptors of every target, and Phase 3 requires subjects to rate every target on every (unique) descriptor, it is clear that PERSPACE can get out of control rather quickly. Moreover, there are limits to the size of the ratings matrix that can be analyzed by most commercially available statistical packages (see further discussion, below).

Fortunately, the supply of usable targets is likely to be exhausted relatively quickly -- although Rosenberg's and Pervin's studies indicate that they are quite capable of going on and on. Version 3.5 accommodates a total of 35 targets. Remember, subjects are not asked to list <u>every</u> person, situation, or event in their lives -- just the most important ones.

When the subject quits this phase, a termination message comes on the screen.

(2) Gather Descriptors

Assuming that it has been set up by the Operator (Operator Menu, Items 3 and 4), the system begins data collection as soon as this option is selected. If the system has not been set up properly -- i.e., if the TARGETS.SUB and TARGETS.RAT files have not been added to the Subject subdirectory -- a prompt will appear. Otherwise, the subject merely enters descriptors in response to the prompts, until the list of targets is exhausted.

In Version 3.5, targets are presented for description in alphabetical order.

If the target list consists of persons (whether freely listed, or elicited by the Kelly or Rosenberg probes), PERSPACE automatically adds three construals of "self" to the list described by Higgins (1987): Yourself, Your Actual Self; Yourself, Your Ideal Self; and Yourself, as You Believe You Ought To Be. These construals of self are included in the maximum of 35 targets permitted by Version 3.5; thus, when operating in free-response mode, PERSPACE collects 32 subject-generated targets.

In principle, subjects could enter an infinite number of descriptors for each target, generating an unmanageably large target-by-descriptor matrix for rating in Phase 3. For the practical reasons given above, this is extremely undesirable. Moreover, considerations of limits on human information-processing capacity (i.e., the magical number 7, plus or minus 2, of Miller, 1956; see also the cardinal traits of Allport, 1937) suggest that no more than about 7 descriptors per target are likely to be useful. Version 3.5 accommodates up to 7 descriptors per target.

When the subject quits this phase, the termination message comes on the screen.

(3) Gather Ratings

Assuming that it has been set up by the Operator (Operator Menu, Items 5, 6, and 7), the system begins data collection as soon as this option is selected. If the system has not been set up properly -- i.e., if the DESCRIPT.SUB, DESCRIPT.ED, and DESCRIPT.RAT files have not been added to the Subject subdirectory -- a prompt will appear. Otherwise, the subject merely enters ratings in response to the paired target-descriptor prompts, until either the set of prompts or the subject is exhausted.

A Caution on Timing of the Subject Sessions

Under ordinary circumstances, it is expected that Phases 1 and 2 will require no more than one hour, each, to complete. In most cases, both phases can be performed in an hour or so.

The predefined limits of 35 targets and 7 descriptors per target should be more than adequate to assessment needs. Note, however, that if subjects generated 7 unique descriptors for each target (arguably an unlikely eventuality), these limits would yield a target-by-descriptor matrix consisting of 8,575 (35 targets x [35x7 = 245 descriptors]) cells, each of which must eventually be filled in during the Rating session. At the rate of one rating per second, it would take a subject 143 minutes, or almost 2-1/2 hours, to complete Phase 3. Most subjects, of course, will require somewhat more time than this to make their ratings. Accordingly, operators may wish to set informal limits on subjects' responses.

PERSPACE requires that the generation of targets and descriptors be completed in one sitting. However, for the reasons just cited, rating every target on every descriptor can get a little tedious. Therefore, Version 3.5 allows subjects to take one or more breaks in the midst of a target-rating session without spoiling the response latency data, and even permit termination of a session and its resumption at a later time.

The target-descriptor pairs are presented for ratings in random order. The sequence of presentation is recorded in the RATINGS.DAT, VIEW.DAT, and DATA.RAW matrices.

Finally, it should be noted that some (but apparently not all) PC-compatible computers allow subject sessions to be terminated precipitously by pressing CONTROL-BREAK or CONTROL-C. Operators are advised not to inform subjects expressly of this fact; else, paradoxical intention on the part of the subject is likely to lead to disaster. Of course, nothing can prevent a determined, computer-wise subject from mucking up the system. Still, with the provision of breaks in the rating session, such an accident will have no long-term consequences: when restarted, the system will pick up where it left off.

A Caution on Running the Same Subject Twice

PERSPACE 3.5 is designed to collect data from only a single sequence of three phases. For example, a subject might be asked to list, describe, and rate all of the important people in his or her life. However, there are circumstances under which more than one sequence of data-collection will be desirable. For example, subjects might be asked to work with more than one set of targets (e.g., to list, describe, and rate situations as well as persons; or to describe a single list of targets on more than one dimension (e.g., descriptions of an event and how that event made the subject feel); or to rate a single list of targets on more than one set of descriptors (e.g., subject-generated and experimenter-supplied; or to rate the same targets, on the same descriptors, on more than one occasion (e.g., before and after therapy, or some significant life-event).

Note, however, that restarting a Target, Descriptor, or Rating session (except, in the case of Rating sessions, a planned interruption) will effectively delete the corresponding data files created during the last such session.

For this reason, it is recommended that at the conclusion of each assessment (i.e., at the end of Phase 3), data generated by the Subject be backed up and retained permanently. The appropriate files then can be copied for second and later uses. As with any other software system, the best advice is to backup the data files.

Changing Screen Color

PERSPACE is designed to be run on a color monitor, and permits a wide variety of color choices for background, foreground (normal and enhanced), and highlighting.

After making a selection, quit to the previous level of the Operator Menu.

Note that changing the screen color affects every part of the program except that which changes the screen color itself. This is intended to prevent accidentally rendering the screen unreadable.

On the IBM PS/2, a total of 16 choices are available for foreground and highlighting. A subset of 8 of these are available for the background.

The effect of the current choice is demonstrated at the bottom of the Color Menu screen.

A Guide to Program Files

PERSPACE contains two different kinds of files. System files run the procedure, and are distributed among three different subdirectories. Subject files contain data generated by the subject, and are stored in a fourth subdirectory that is created by input of identifying information by the Operator. On the distribution disk, these subject files pertain to the demonstration subject discussed below.

Also, the distribution disk contains, in a fifth subdirectory, BMDP job control language, and statistical analysis output, generated by the demonstration subject.

System Files

The following system files are found on the installation disk and must be present for the PERSPACE program to work properly:

In Subdirectory PERSPACE

PERSPACE.EXE	¦	This is the PERSPACE Program.
COLORS.SCR	¦	Contains the user's selected Screen Attributes.
LIST.COM	¦	Public Domain Listing Program.

In Sub-Subdirectory PERSPACE\TPROMPTS

KELLY.PER	¦	Categories of Persons Suggested by Kelly (Kelly, 1955).
KELLY.EVE	¦	Categories of Episodes Suggested by Kelly (Kelly, 1955).
ROSENBER.PER	¦	Categories of Persons Suggested by Rosenberg (Rosenberg, 1977).
MAYMAN.EVE	¦	Categories of Early Recollections Suggested by Mayman (Mayman, 1968).
PERVIN.SIT	¦	Categories of Situations Suggested by Pervin (Pervin, 1976).
FREELIST.PER	¦	"Please list all the Important People in your Life".
FREELIST.EVE	¦	"Please list all the Important Situations in your Life".
FREELIST.SIT	¦	"Please list all the Important Events in your Life".

Note that the original set of PERSPACE target prompts supplied on the distribution disk is dated 07/10/90. Users of the system are, of course, free to revise these files as convenient.

In Sub-Subdirectory PERSPACE\DESCRIPT

BENJAMIN	{	Benjamin Interpersonal Circle Descriptors (Benjamin, 1974).
EKFRIES	{	Ekman/Friesen Basic Emotions (Ekman & Friesen, 1971).
FEHRRUSS	{	Fehr/Russell Affect Terms (Fehr & Russell, 1984)
GOLD1710	{	Goldberg 1710 Trait Adjectives (Goldberg, 1977).
MCCRAE	{	McCrae and Costa Traits (McCrae & Costa, 1987).
MCCRAE.WEE	{	Short McCrae and Costa Traits. (McCrae & Costa, 1987).
NORMAN	{	Norman Traits (Norman, 1963).
PEABODY	{	Peabody Traits (Peabody, 1987).
PEABODY.WEE	{	Short Peabody Traits (Peabody, 1987).
PLUTCHIK	{	Plutchik Affect Structure (Plutchik, 1980).
RUSSCIRC	{	Russell Affect Circumplex (Russell, 1981).
SCHWSHA	{	Schwartz/Shaver Affect Categories Shaver, Schwartz, Kirson, & O'Connor (1987).
TELLEGEN	{	Tellegen Affect Circumplex Watson & Tellegen, 1985).
WIASRB5	{	Wiggins IASR-B5 Trait Adjectives (Trapnell & Wiggins, 1990).
WIGGINS	{	Wiggins Interpersonal Traits (Wiggins, 1979).
WIGGINS.WEE	{	Short Wiggins Interpersonal Traits (Wiggins, 1979).

Note that the original set of PERSPACE descriptor prompts supplied on the distribution disk is dated 07/09/90. Users of the system are, of course, free to revise these files as convenient.

In Sub-Subdirectory PERSPACE\DOCUMENT

USER.MAN (this document
(edited in WordPerfect 5.1).

Note that a shortened version of the official PERSPACE user manual, PERSPACE.WEE, supplied on the distribution disk is dated 11/22/92. The version supplied lacks representations of the screens and certain other illustrative material.

The distribution disk may also contain the Turbo Pascal source code for PERSPACE, thus permitting programmers to make modifications to the system. These files are stored in a separate subdirectory.

In Subdirectory PERSPACE\SOURCE:

PERSPACE.PAS
OP_UTILS.PAS
SUB_UTIL.PAS
UTILS.PAS

Note also that three other files are created when Turbo Pascal compiles these four files into an executable file (PERSPACE.EXE):

OP_UTILS.TPU
SUB_UTIL.TPU
UTILS.TPU

These three files are not necessary and have been deleted.

Subject Files

In addition to the system files, the following subject files are stored a subdirectory that is created for each individual subject on the chosen drive. The name of the Subdirectory is formed by using the first six characters of the Subject's last name, followed by an underscore and the first character of the Subject's first name. The files are generated by the system to capture the necessary data generated in the session.

In the Subdirectory created for each Subject

SUBJECT.INF	{	Information entered in the opening screen and/or updated later.
SETTINGS.INI	{	Initial settings used by the system to keep track of files, variables, etc.
TARGET.INP	{	Prompt file used for inputting Targets.
TARGETS.SUB	{	Targets generated by the Subject.
TARGETS.RAT	{	Edited set of Targets used by the Program for rating by the Subject.
DESCRIPT.SUB	{	Descriptors generated by the Subject.
DESCRIPT.ED	{	Edited set of Descriptors.
DESCRIPT.RAT	{	Descriptors used by the Program for rating by the Subject.
RATINGS.DAT	{	Target X Descriptor Matrices of Ratings, Response Latencies, and Order of Presentation.
VIEW.DAT	{	Contains the data found in Targets.SUB, Descript.SUB, and Ratings.DAT.
DATA.RAW	{	Same as in Ratings.DAT, except rotated and unformatted and ready for export to a statistics package.

Analyzing Data from PERSPACE

At the conclusion of Phase 3 of the Subject Session, the rating procedure has generated a matrix summarizing the ratings made by the subject. The matrix for each subject may be submitted to a variety of multivariate statistical analyses, including factor analysis, multidimensional scaling, and cluster analysis. When the primary concern is with the relationships among individual entities (persons, situations, events) rather than their constituent features, the preferred technique is hierarchical cluster analysis, which groups the targets together based on similarity of descriptors (Anderberg, 1973; Baker & Hubert, 1975; Blashfield, 1976; Everitt, 1974, 1979; Hubert, 1974; Johnson, 1967; Kuiper & Fisher, 1975). Cluster analysis begins by considering each target as a separate cluster, and then groups clusters together according to their similarity in terms of the attribute ratings. A cluster is added to an existing cluster only when it is more similar to all members of the cluster than it is to all members of any other available cluster. The resulting solution is hierarchical in that it produces clusters at various levels. At the lowest level, each target forms its own cluster; at the highest level, there is only one cluster -- the entire batch of targets generated by the subject. Most interest focuses on clusters at the middle level, which group relatively many targets together with relatively little loss of homogeneity.

It is important to underscore that the dimensions, factors, and clusters uncovered by these multivariate analysis reflect the way that the subjects perceive themselves and the social world around them. Especially when the cluster analysis is accompanied by a list of the features common to and characteristic of the entities (persons, situations, or selves) in that cluster, it can provide a rich body of information concerning the person's conscious mental representations of self and others. At the simplest level, a content-analysis program can count the number of times a particular attribute appears in the subject's lists. Items with high frequencies of use are good candidates for personal constructs, while the range of such frequencies, and the patterns of co-occurrence among attributes, may be good indications of the person's level of cognitive complexity.

When the final target-by-attribute matrix is submitted to cluster analysis, grouping targets together on the basis of similarity of features, one obtains a graphic display of how the individual organizes his or her social world. A sample is given below.

Example Analysis

To demonstrate the PERSPACE program, we present an imaginary protocol. Files created in the process of running this protocol are provided in the subdirectory TEST_A on the distribution disk. The data generated in this exercise can be inspected and printed by using the VIEW DATA and PRINT DATA utilities described above. The entire VIEW.DAT file is provided as Appendix 3.

A specimen BMDP program to analyze the data with Program 2M (Cluster Analysis by Cases), and the output of this program, are found in the BMDPDEMO subdirectory, also on the distribution disk. The BMDP control language, and the entire output, are provided in Appendix 4.

In this application, PERSPACE was programmed to request free listings of both Targets and Descriptors. Descriptive information on the subject, input by the operator, is held in the SUBJECT.INF file on the subject's individual subdirectory.

In the first phase, our example subject was asked to generate a list of some important people in his life (last names were omitted to protect the innocent, but two last initials were necessary to distinguish between two targets with the same first name). This prompt, customized in the Target Prompts Selection Menu, is stored in the TARGET.INP file.

This exercise produced the following list of Target names, and their corresponding response latencies, stored in the TARGETS.SUB and VIEW.DAT files (the latter displayed below). The mean inter-response latency was 1.85 seconds, with a standard deviation of 0.57 seconds.

```
"Some Important People in Your Life"

 2.3s. =^P Betsy
 2.2s. =^P Beverly
 1.2s. =^P Bob
 1.5s. =^P Bill
 2.4s. =^P Carol
 1.8s. =^P Doug
 1.3s. =^P Ernie
 2.1s. =^P George
 1.5s. =^P Heather
 1.8s.  ^P Irene
 2.0s.  ^P Jeanne
 2.6s.  ^P Jennifer D.
 4.1s.  ^P Jennifer E.
 1.4s.  ^P Judy
 1.9s.  ^P Larry
 1.6s. =^P Leanne
 1.9s. =^P Lori
 1.5s. =^P Margie
 2.1s. =^P Martha
 1.9s. =^P Michael
 1.2s. =^P Pat
 1.5s. =^P Paula
 2.2s. =^P Rebecca
 2.0s. =^P Shelagh
 1.3s.  ^P Stan
 1.9s.  ^P Stevens
 1.4s.  ^P Susan
 1.4s. =^P Terry
 1.8s. =^P Victor

The Response Latency Mean is:   1.85s.
The Response Latency Standard Deviation is:   0.57s.
```

In the second phase, our example subject was asked to describe each of the targets. His descriptive vocabulary consisted of only 11 different terms. Precisely identical terms input during this phase were automatically edited out of the DESCRIPT.ED and DESCRIPT.SUB files. These items were stored in the DESCRIP.* files. Had the items in DESCRIPT.SUB required any editing for clarification or to eliminate redundancy, the edited list would have been stored in the DESCRIPT.ED and DESCRIPT.RAT files.

Had we skipped the second phase, and chosen to impose on our subject a set of ratings of our own choosing, these experimenter-supplied descriptors, taken from the lists available in the PERSPACE\DESCRIPT subdirectory, would have been stored in DESCRIP.RAT.

In some cases, the three construals of self -- actual, ideal, and ought -- are automatically added to the list for description.

In any event, the contents of the DESCRIP.SUB file, including the corresponding response latencies, are available for inspection in the VIEW.DAT file (displayed below). The average response latency was 3.22 seconds, with a standard deviation of 1.97 seconds.

```
"Please Describe This Person"

   Betsy
       6.9s.  ^P manxome
       2.0s.  ^P uffish

   Beverly
       4.3s.  ^P slithy

*****

   Victor
       3.5s.  ^P uffish
       1.8s.  ^P tolgey


The Response Latency Mean is:   3.22s.

The Response Latency Standard Deviation is:   1.97s.
```

After completing his list, our subject realized that he had omitted an important name, "Will". Accordingly, the Operator used the Edit Targets utility to add "Will" to the list. This edited Target list is stored in the TARGETS.RAT file, which is used in the third, ratings, phase.

In the third phase, the system created a matrix consisting of the edited Target (columns) and Descriptor (rows) lists, and filled the corresponding 330 cells (30 columns, representing targets, by 11 rows, representing descriptors) with a random sequence of numbers indicating the order of presentation to the subject. Each combination of Target and Descriptor was then presented to the subject for a rating. In this case, the rating was on a simple 0-1 scale, with the numbers representing "No" or "Yes", respectively. It took our subject approximately 18 minutes to make these 330 ratings, at a rate of about 3.3 seconds per rating.

The following is the descriptor X target matrix of ratings given by the subject:

TARGETS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
2	0	1	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
3	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
4	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	0
5	1	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	1	0	1	1	0	0	0	1	0	0	1	1	1
6	0	1	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
7	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	0
8	0	1	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
9	1	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	1	0	1	1	0	0	0	1	0	0	1	1	1
10	1	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	1	0	1	1	0	0	0	1	0	0	1	1	1
11	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	0

In addition, PERSPACE computes the marginal rating and response latencies for each target (over all descriptors) and each descriptor (over all targets), and stores these for inspection in the VIEW.DAT file (displayed below).

Data analysis employed the DATA.RAW file, which is the same as the RATINGS.DAT file, except it is unformatted. Moreover, the matrix has been rotated, with Targets as rows and Descriptors a columns, to make it compatible with the input format expected by BMDP and other conventional statistical packages. The analysis below is limited to the ratings matrix; the latency matrix was deleted.

For convenience in interpreting the output, case labels representing the targets' first names were added to the 24x11 matrix. This expanded matrix was then submitted to Program 2M (Cluster Analysis by Cases) of the BMDP statistical package (BMDP Statistical Software, 1988 Release). This proprietary software is not provided in the PERSPACE distribution disk! However, the matrix is compatible with the multivariate-analysis routines in all known commercial statistical packages.

The defaults (displayed below) for the BMDP 2M cluster analysis -- Euclidean distance measure, data standardized to z-scores, and single linkage algorithm -- should suffice for most assessment purposes.

Note that BMDP can handle a matrix of no more than 7,396 cells (or a square matrix of 86 targets by 86 descriptors; descriptors can be incremented by each target subtracted, so that the product does not exceed 7,396). This matrix is actually larger than the limit of PERSPACE -- which, as noted earlier, is a matrix of 8,575 cells. The maximum matrix size for BMDP corresponds to 7 unique descriptors for each of 32 targets, or 6 unique descriptors for each of 35 targets. Another good reason for keeping the number of targets and/or descriptors generated by subjects under control!

Sample BMDP Input

```
/problem     title = 'PERSPACE Demonstration'.
/input       variables = 13.
             format = '(11(f1,1x),2A4)'.
/variable    name = beamish, brillig, frabjous, frumious, manxome,
                   mimsy, outgrabe, slithy, tolgey, uffish, vorpal,
                   name1, name2.
             label = name1, name2.
/end
0 0 0 0 1 0 0 0 1 1 0 Betsy
0 1 0 0 0 1 0 1 0 0 0 Beverly
0 1 0 0 0 1 0 1 0 0 0 Bob
0 1 0 0 0 1 0 1 0 0 0 Bill
1 0 1 0 0 0 0 0 0 0 0 Carol
0 0 0 0 1 0 0 0 1 1 0 Doug
0 0 0 1 0 0 1 0 0 0 1 Ernie
1 0 1 0 0 0 0 0 0 0 0 George
0 1 0 0 0 1 0 1 0 0 0 Heather
0 0 0 1 0 0 1 0 0 0 1 Irene
0 0 0 1 0 0 1 0 0 0 1 Jeanne
0 0 0 0 1 0 0 0 1 1 0 JnnfrD
1 0 1 0 0 0 0 0 0 0 0 JnnfrE
0 1 0 0 0 1 0 1 0 0 0 Judy
0 0 0 0 1 0 0 0 1 1 0 Larry
0 0 0 1 0 0 1 0 0 0 1 Leanne
0 0 0 0 1 0 0 0 1 1 0 Lori
0 1 0 0 0 1 0 1 0 0 0 Margie
0 0 0 0 1 0 0 0 1 1 0 Martha
0 0 0 0 1 0 0 0 1 1 0 Michael
0 0 0 1 0 0 1 0 0 0 1 Pat
0 0 0 1 0 0 1 0 0 0 1 Paula
1 0 1 0 0 0 0 0 0 0 0 Rebecca
0 0 0 0 1 0 0 0 1 1 0 Shelagh
0 1 0 0 0 1 0 1 0 0 0 Stan
0 0 0 1 0 0 1 0 0 0 1 Stevens
0 0 0 0 1 0 0 0 1 1 0 Susan
0 0 0 0 1 0 0 0 1 1 0 Terry
0 0 0 0 1 0 0 0 1 1 0 Victor
0 0 0 1 0 0 1 0 0 0 1 Will
/end
```

The output of BMDP Program 2M (an edited version of which is displayed on the following pages) yielded four distinct clusters of Targets.

Our subject's "Favorite People" are grouped into four distinct clusters, each of whose members are perceived to be more similar to each other than they are to the members of other clusters.

Cluster 1 contains eleven individuals (Betsy, Doug, JenniferD, Larry, Lori Martha, Sheila, Susan, Terry, and Victor), all described as manxome, uffish, and tolgey.

Cluster 2 contains eight individuals (Ernie, Irene, Jeanne, Leanne, Pat, Paula, Stevens, and Will), all described as outgrabe, frumious, and vorpal.

Cluster 3 contains seven individuals (Beverly, Bill, Bob, Heather, Judy, Margie, and Stan), all described as brillig, slithy, and mimsy.

Cluster 4 contains four individuals (Carol, George, JenniferE, and Rebecca), all described as frabjous and beamish.

Sample BMDP Output

```
       C N
         O      1 1 1 1 2 2 2 2 2 3 2 2 2 1 1 1   2 1 1         2 1
       A .  1 6 2 5 7 9 0 4 7 8 9 0 6 2 1 6 1 0 7 5 8 4 9 4 3 2 3 3 8 5

       S L  B D J L L M M S S T V W S P P L J I E S M J H B B B R J G C
         A  e o n a o a i h u e i i t a a e e r r t a u e i o e e n e a
       E B  t u n r r r c e s r c l e u t a a e n a r d a l b v b n o r
         E  s g f r i t h l a r t l v l   n n n i n g y t l   e e f r o
         L  y   r y   h a a n y o   e a   n n e e   i   h     r c r g l
                D     a e g     r   n     e e       e   e     l c E e
                        l h         s                   r     y a

 AMALG.
DISTANCE
            * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
    0.000   -+- I I I I I I I I I I I I I I I I I I I I I I I I I I I I
    0.000    -+-- I I I I I I I I I I I I I I I I I I I I I I I I I I I
    0.000     -+--- I I I I I I I I I I I I I I I I I I I I I I I I I I
    0.000      -+---- I I I I I I I I I I I I I I I I I I I I I I I I I
    0.000       -+----- I I I I I I I I I I I I I I I I I I I I I I I I
    0.000        -+------ I I I I I I I I I I I I I I I I I I I I I I I
    0.000         -+------- I I I I I I I I I I I I I I I I I I I I I I
    0.000          -+-------- I I I I I I I I I I I I I I I I I I I I I
    0.000           -+--------- I I I I I I I I I I I I I I I I I I I I
    0.000            -+---------- I I I I I I I I I I I I I I I I I I I
    0.000             I           I I I I I I I I I I I I I -+- I I I I
    0.000             I           I I I I I I I I I I I I --+-  I I I I
    0.000             I           I I I I I I I I I I I ---+-   I I I I
    0.000             I           I I I I I I I I I I ----+-    I I I I
    0.000             I           I I I I I I I I I -----+-     I I I I
    0.000             I           I I I I I I I I ------+-      I I I I
    0.000             I           I I I I I I I I       I       I I -+-
    0.000             I           I I I I I I I I       I       I --+-
    0.000             I           I I I I I I I I       I       ---+-
    0.000             I           I I I I I I -+-       I          I
    0.000             I           I I I I I --+-        I          I
    0.000             I           I I I I ---+-         I          I
    0.000             I           I I I ----+-          I          I
    0.000             I           I I -----+-           I          I
    0.000             I           I ------+-            I          I
    0.000             I           -------+-             I          I
    5.227             --------+-----------              I          I
    5.357                     -------+-------------------          I
    5.405                            ----+--------------------------
```

Psychometric Properties of PERSPACE as an Assessment Instrument

PERSPACE is intended to be used for assessment purposes. In principle, any psychometric instrument should have four properties: a standardized format and method of administration and scoring; norms from a sample representative of the population in which the instrument is to be applied; reliability, in terms of internal consistency, interjudge agreement, or test-retest stability; and validity, in terms of empirical relations with an external criterion of the attribute ostensibly measured by the instrument. These are not easy standards to meet in an instrument designed for idiographic use, but it is possible to indicate how each of these issues might be treated during further program development.

Standardization. In some sense, standardization is inherent in the technique, as the whole assessment enterprise is completely under computer control. However, for purposes of nomothetic assessment -- comparing the spaces found in different (types of) patients, for example -- more standardization might be in order. For this reason, PERSPACE includes an option through which the assessor can provide either the targets, or the features, or both to the subjects -- rather than letting them generate both freely. Under these circumstances, subjects can be compared with each other (or aggregated groups of subjects could be compared with other aggregated groups) with respect to the manner in which they organize a standard set of targets. This option would permit complete standardization, although of course it would effectively destroy the technique as a idiographic clinical assessment device.

Norms. Norms really are irrelevant to idiographic assessment. In any event the PERSPACE procedure is arduous (and expensive) enough to effectively prevent us from collecting normative data on a large, representative sample of the (presumably nonpatient) population. However, it would be a relatively simple matter to determine the most frequently listed targets and features within each broad category (e.g., persons, situations, or events).

Reliability. Interjudge agreement is clearly irrelevant, as no judges are involved in this procedure. However, a related issue is presented by the nature of the solutions generated by cluster analysis programs. These solutions are hierarchical: at one level, maximizing homogeneity, there are as many clusters as there are entities. At another level, minimizing the number of clusters, there is only a single cluster including the entire set of entities. By analogy, a factor analysis yields at one level, as many factors as there are items, and at another a single general factor running through the entire item set. A successful cluster analysis yields an intermediate number of clusters, partitioning the solution at some middle level, that groups a relatively large number of targets together with relatively little loss of homogeneity. Unfortunately, there are no algorithms (such as excluding factors with eigenvalues less than 1.0) available for determining precisely where the best partition level lies.

This problem of tradeoff remains a judgmental matter, introducing the problem of the reliability with which different observers would assign the same partition level to a given solution. This is, of course, an empirical matter that could be studied using simulated cluster-analysis solutions.

The internal consistency of the subject's responses is also a matter of some concern, because the commonest use for the technique will involve a single assessment. If the subject's responses are unreliable, then any clustering solution derived from them must be meaningless. The standard way of assessing internal consistency is some variant on Cronbach's coefficient alpha. In the present context, probably the best approach is through a variant on split-half reliability. After the entire target-by-feature matrix has been constructed the entire set of targets or features is randomly divided into halves that each represent an unbiased sample of the subject's ratings, and cluster analysis is applied to each half separately. If the structures are reliable, essentially the same hierarchical solutions should be obtained in the halves as were obtained in the whole set.

The standard strategy for assessing test-retest stability is to have the person complete a procedure on two separate occasions. There are several different ways of applying this strategy. (a) Reliability of listing a particular target: If a subject includes "Father" on his first list of "People I Know", will he also do so on his second? (b) Reliability of listing a particular feature: If a subject lists "Loving" somewhere on her first list, will that attribute also appear on the second? (c) Reliability of listing a particular feature for a target: If a subject freely describes her "Father" as "Handsome" on an initial test, will she do so again on the retest? (d) Reliability of assigning a particular rating: If a subject gives "Father" a rating of 1 ("Somewhat Applicable") on "Loving" during the test, will he do so again on the retest? (e) Reliability of solution: Will the hierarchy extracted in the cluster analysis of the initial test resemble that extracted in the retest? These forms of reliability can be assessed with standard contingency and correlation statistics. The problem, again, is that the full procedure is necessarily arduous and expensive. Therefore, for purposes of reliability studies (especially the last two) we might want to work with an abbreviated form of the procedure -- e.g., one in which subjects list only 5 features for each of 20 central targets.

Validity. This is, perhaps, the toughest nut to crack. In some sense the procedure attempts to determine how the subject perceives the social world, and there is not really any way to check (or contradict) the data that flows from it. Perhaps alternative cognitive tasks can provide convergent validity of the structures obtained from cluster analysis. In addition, the possibility of a validity check is suggested by Bruner's old dictum that "The purpose of perception is action". That is, the person ought to behave similarly toward targets that are clustered together in subjective space. For example, consider form of the mapping technique intended to identify context-specific selves. The subjects would list the current situations in their lives, describe themselves in each of these situations, and then rate themselves in each situation in terms of each descriptor. Suppose the cluster analysis for a particular subject indicated that Self in Situation A was very similar to Self in Situation B, but very different from Self in Situation C. If we could observe the subject in each of the situations, or obtain personality ratings of the subject by judges who have had the opportunity to observe him or her in one situation but not the others, we would expect similar behaviors or ratings in A and B, different ones in C. Magnusson and Mischel, among others, have done studies of this broad type. They are expensive, but positive results would have considerable theoretical as well as practical importance.

Application. Despite concern with its psychometric properties -- standards that have been developed in the context of nomothetic assessment -- PERSPACE is intended for idiographic assessments, especially in clinical contexts. It is intended to enable clinicians to enter the subjective worlds of their clients, and for clients to articulate what might otherwise be a rather inchoate mass of impressions and reactions, and to reflect on themselves and their personal relationships.

As we envision its clinical use, PERSPACE will be employed early in the therapeutic cycle, as part of routine intake assessment. Thus, at the same time as the client is receiving the standard battery of psychological tests, he or she will also be completing a version of PERSPACE. (Many clients must be placed on a waiting list before they can be seen: PERSPACE, which is designed to be completed by a subject with minimal involvement from the therapist or technician, would seem to be a perfect way to occupy their time). Thus, near the outset of treatment, the therapist will have available a graphic representation of the important people, places, or events in the client's life (as seen by the client) and how they are perceived (again, by the client) to be related. But unlike the results of other psychological tests, we do not intend that the PERSPACE map be held _in pectore_ by the therapist. Rather, we believe that the results of the assessment should be shared with the client, and that clients should be actively encouraged to reflect on their significance.

Since the focus of psychodynamic therapy is on social relationships and personal experiences, rather than symptomatic behaviors, and the goal of therapy is to change these relationships, or at least the client's perspective on them, we also suggest that the PERSPACE procedure be repeated at the point of discharge, as a way of gauging what has been accomplished. Some economies may be injected into the followup assessment by eliminating the first two segments of the procedure -- retaining the original (edited) sets of targets and descriptors, and simply asking the client to provide a new set ratings, resulting in a second target x descriptor matrix for comparison with the first. If anything has changed over the course of treatment, we should expect the second PERSPACE map to differ from the first, and in particular ways dictated by the goal of treatment.

Certain research uses are also suggested by the technique. For example, our laboratory has long been interested in the notion of context-specific selves -- that is, in the idea that one's mental representation of oneself is not monolithic, but rather includes a number of rather different self-concepts, each specific to a particular class of social situations (Kihlstrom & Cantor, 1984; Kihlstrom et al., 1988). In ongoing research, we ask people to generate a list of the important situations in their lives, and then ask them to describe themselves in each of these situations. In principle, the resulting clusters represent context-specific selves. Observations of the subject in these different situations, or ratings of the subject made by the people that he or she encounters in them, should reveal significant differences corresponding to the different self-concepts.

Similarly, subjects might be asked to list the important people in their lives, and then describe themselves in relation to them. Again, the resulting clusters represent context-specific selves, with persons rather than situations serving to define the different contexts. If two people grouped closely together have radically different impressions of the person, or if the person displays quite different patterns of behavior in their presence, this might indicate a clinically significant discrepancy between self-perception and reality. These kinds of self-rating procedures are not so arduous as they sound -- in fact, in our experience of pilot studies, college student subjects find it quite interesting; there is no reason to think that other psychologically minded persons shouldn't as well. With the advent of powerful, high-speed microcomputers, and sophisticated statistical analysis packages to run on them, the assessment technology proposed herein is within reach of even modest laboratories and clinics.

An Invitation

Users of PERSPACE are invited to experiment with various applications of the program, and to send any comments to:

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Author Notes

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