PCAD 2000:

Psychiatric Content Analysis and Diagnosis

GB Software

Louis A. Gottschalk M.D. Ph.D
Robert J. Bechtel Ph.D.

4607 Perham Road
Corona del Mar, CA 92625
+1.949.760.2639 (fax)
http://www.gb-software.com
info@gb-software.com

Table of Contents

PCAD 2000:
Psychiatric Content Analysis and Diagnosis

Quick Overview

PCAD 2000 is a software program that performs content analysis of input text on scales developed by Louis A. Gottschalk, Goldine Gleser, and their research associates (the Gottschalk-Gleser scales). These scales and associated methodology were originally created for application by trained human scorers to transcribed recordings of spoken verbal samples obtained in response to a standardized prompt. The scales measure states of neuropsychiatric interest, such as anxiety, hostility, and cognitive impairment.

In the years since the original scales and procedures were devised, additional scales have been created, and the techniques have been adapted to a wide variety of uses. Numerous studies have confirmed the validity and reliability of the scales in measuring affect, including cross-language and cross-cultural studies.

PCAD 2000 was developed to eliminate extensive training of human scorers and decrease the time required to analyze samples. The current program is the most recent in a succession of software dating back over twenty years, and is used for research around the world. It runs under the Microsoft Windows operating system (Windows 95 or later).

This manual provides the information needed for a professional to use PCAD 2000 as a tool in research or clinical practice. Recognizing that it can be difficult and time-consuming to do extensive research into the content analysis method itself, we provide a summary of the scales, their development, and their employment in a range of areas, with literature citations for further detail where desired. Installation and operation of the software is described, as is preparation of samples for processing by the program. Finally, in recognition that no software that is complex enough to be useful is likely to be free of all errors, we describe what errors may look like, and how to react if they occur.

For those who cannot resist, the installation process follows the default standard: Insert the installation medium (CD-ROM or diskette #1, as appropriate) into a drive, then select Start|Run|*drivename*:setup.exe and follow the prompts. Installation should add PCAD2000 to your list of Programs on the Start menu. Once you start the program, there is a "guide" to take you through the scoring process step-by-step, and two examples of sample files are included in the distribution for practice and demonstration.

Installing the Software

System Requirements

PCAD2000 is designed to run under Microsoft Windows 95 or Windows 98 (original and SE). It was developed under Windows 95, and has been most extensively tested under Windows 98. PCAD2000 has been successfully installed and executed on Windows 3.1, 3.11, and Windows for Workgroups, provided that the WIN32s extensions have been properly installed prior to installation of PCAD2000. PCAD2000 has also been successfully used on Windows NT 4.0 Workstation, Windows ME, and Windows 2000 Professional, though it has been less extensively tested in these latter environments.

The minimum memory needed to run PCAD2000 is 16 megabytes, and GB Software recommends a (much) larger amount to enhance processing -- for Windows 98 and NT, 128 megabytes is suggested. The PCAD2000 software and dictionaries occupy approximately 7 megabytes of disk space -- be sure to allow more room for your samples and for scoring output. It is not unusual for a one-to-two page long input sample to produce over twenty pages of scoring output, if all output options are enabled.

So far as we have tested, PCAD2000 runs on any processor capable of running the required Windows operating system. GB Software has tested on both genuine Intel and Cyrix processors without encountering problems, but we cannot be responsible for any incompatibilities caused by your particular hardware configuration. Obviously, faster processors will produce results more quickly.

GB Software is aware of no special requirements on keyboards, pointing devices, or displays. It is worth noting that printer output is straight ASCII; so PCAD2000 will not work properly with a Postscript-only printer.

Packing List

PCAD2000 is shipped on three 3½ inch diskettes or one CD-ROM. In addition to the distribution media, you should have received this user manual and reference guide. If there are any last-minute changes to the package, there may also be one or more pages describing those changes, or there may be a file named README.1ST on the first diskette or on the CD-ROM. If there is a README.1ST file, please review it before doing the installation, in case there are changes to the procedure.

The PCAD2000 installation process is automated, but does require that you either confirm choices that the installation program makes or provide alternative choices. The installation program will place things in a directory named PCAD 2000 under the Program Files directory on your main drive.

Check for Available Space

As with the storage location, the installation process will attempt to check for adequate space. However, it is usually a good idea to check by yourself before running

the installation program, since there are (rare) conditions that can fool the installation program. Also, even if the installation program does properly detect that there is insufficient space, the installation must halt for you to remedy the problem, and then must be restarted. The installation simply goes more smoothly if you ensure that there is sufficient free space on the drive you wish to use.

Run Installation Program

From Diskette

Place the diskette marked "1 of 3" in a 3½ inch diskette drive. From the Start menu select Run, and type x:\SETUP.EXE in the "Open" box, where x is the drive letter for the 3½ inch drive you are using. Click on the "OK" button to start the installation program. Follow the instructions on the screen.

> **Setup**
>
> The setup program will set up the application and its associated files.
>
> Select Continue to move through the setup process. Select Back to review or change responses. Select Exit to end the installation process.
>
> [Continue]   [Exit]
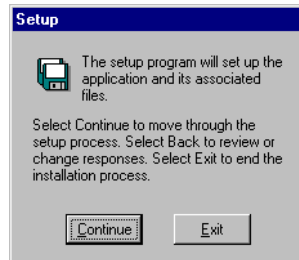
PCAD will be installed in the directory \Program Files\Pcad. Files will be copied from the distribution diskette to your hard drive.

> **Processing Files**
>
> Appending:
> A:\gbsoft2$.img
> To:
> C:\WINDOWS\TEMP\gbsoft.img
>
> [███   ]
>
> [Cancel]
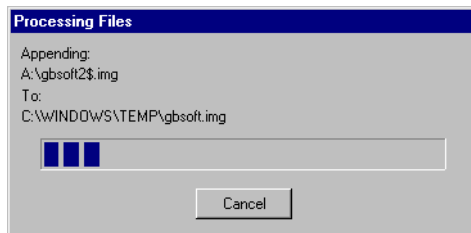
The instructions will tell you when to change diskettes.

> **PCAD2000**   ✕
>
> (i)   Insert disk labeled 'Disk #2'
>
> [OK]   [Cancel]

More files will be copied. The install program will set up shortcuts and place the program on your "Start" menu. When the installation is concluded, remove the final 3½ inch diskette from the drive and put all of the diskettes in a safe place.

> **Setup Success**
>
> The setup process was successful!
>
> [OK]

3
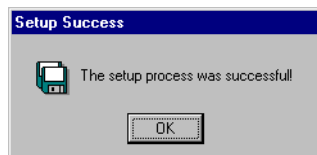
From CD-ROM

Place the CD-ROM in a CD-ROM drive. (This could be a CD-ROM compatible DVD drive, a CD-R, or CD-RW drive.) From the Start menu select Run, and type *x*:\SETUP.EXE in the "Open" box, where *x* is the drive letter for the CD-ROM drive you are using. Click on the "OK" button to start the installation program. Follow the instructions on the screen.
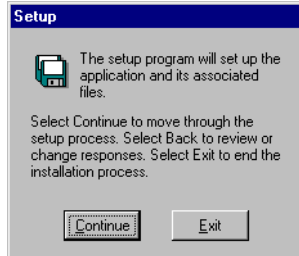
PCAD will be installed in the directory \Program Files\Pcad. Files will be copied from the distribution CD-ROM to your hard drive. The install program will set up shortcuts and place the program on your "Start" menu. When the installation is concluded, remove the CD-ROM from the drive and put it in a safe place.

In some cases, a narrow notification box may pop up when items have been added to the "Start" menu, before the success notification. If this happens, click on the "OK button" area of the narrow notification box to acknowledge the message and conclude the installation.

Running PCAD 2000: Guided Execution Mode

Windows 95/98/NT Start Menu

Click on the Start button, select Programs, then locate the PCAD2000 folder (under whatever name you gave it). Selecting this folder should offer a submenu with Scoring as one of the choices (see Figure 1). Click on Scoring to launch the program.
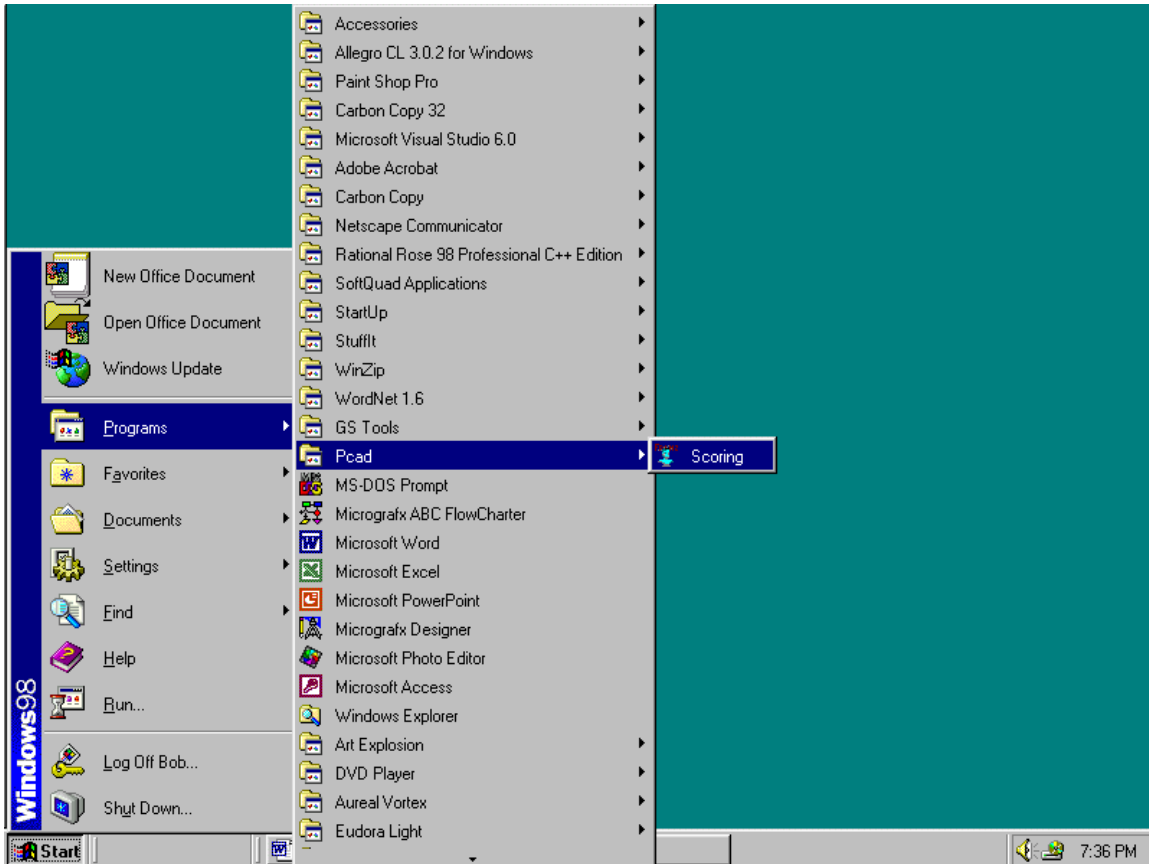
Figure 1: Starting PCAD2000

PCAD2000 will be loaded from the disk and executed. Depending on the speed of your system, this could take several seconds. When ready for use, the main PCAD2000 screen will appear (see Figure 2).
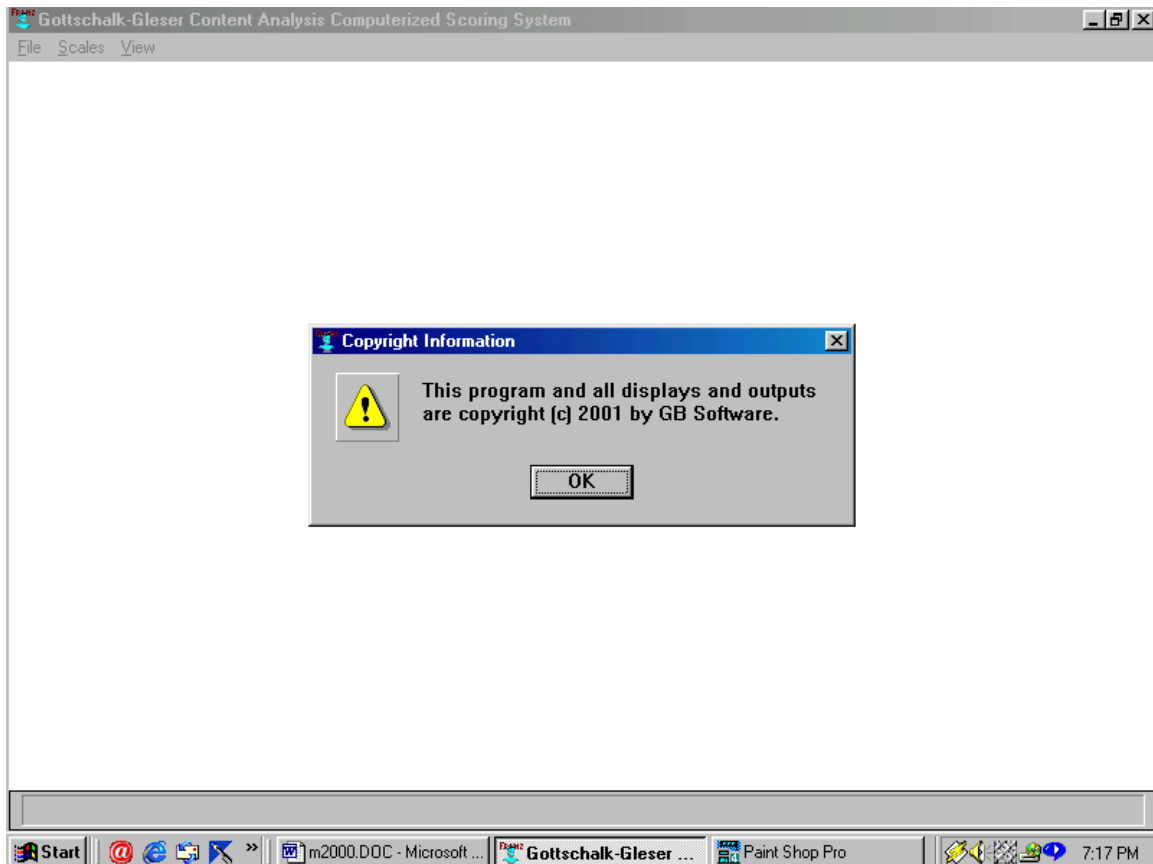
Figure 2: Main screen with copyright notice

Start PCAD2000 and acknowledge the credits by clicking on **OK**.

PCAD2000 has been designed with a "guided tour" through the scoring process. This feature is intended to enable users to perform the most common scoring processes by simply responding to scoring system prompts, rather than having to remember menu and command options. This option is available after acknowledging the credits, as shown in Figure 3.
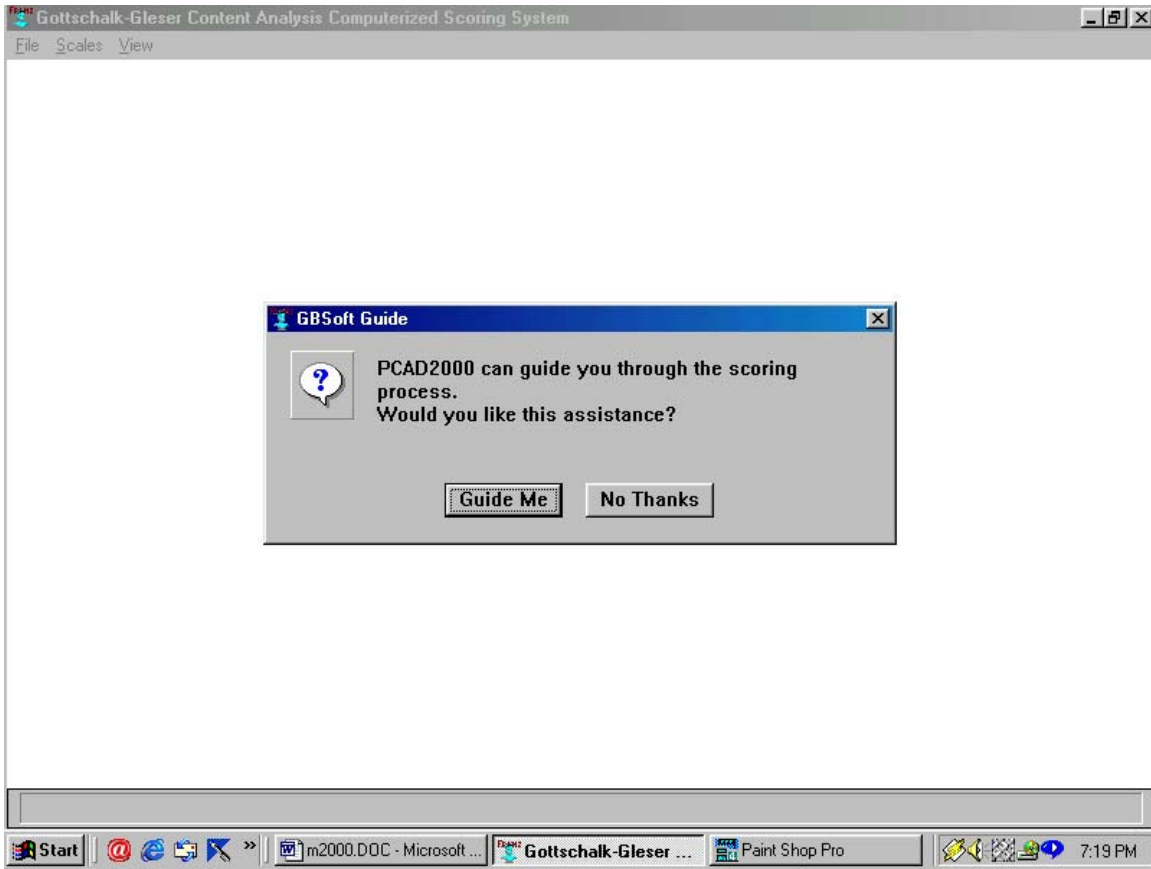
Figure 3: Automatic Guide Available

If you select "No Thanks", the guided execution will stop, and you may use the regular user interface as described later in the section titled "Running PCAD 2000". If you choose "Guide Me", PCAD2000 will offer step-by-step directions to lead you through the scoring process.

Selecting a Sample

The first step is sample file selection, as shown in the next two screen shots.
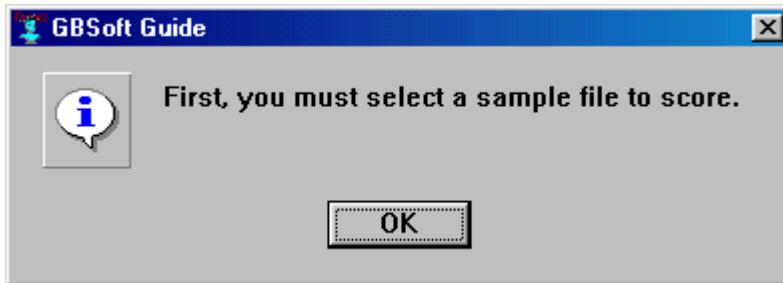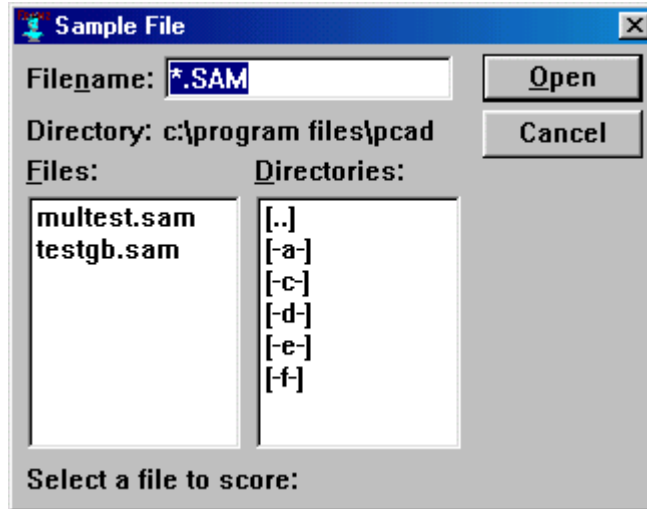
Selecting a sample file may require some interaction with the "Sample File" dialog box. There are several components to this box, as shown below.
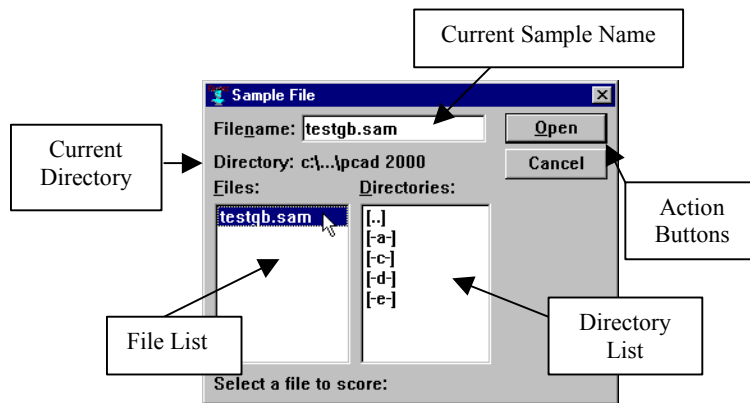
When you first begin to open a file, the Current Directory will probably be shown as "c:\…\Pcad". Unless you have stored sample files in this directory, the only samples shown in the File List will be the examples included with PCAD 2000. The Current Sample Name will probably be "*.SAM", and the directory list will probably look as it does in the figure above.

To move to the directory where you saved your sample, you will need to maneuver through the directory tree. You do this by using the Directory List. For example, if you save your samples in the directory "C:\My Documents", you could move to that directory by first double-clicking on the "[..]" entry at the top of the Directory List. This tells PCAD 2000 to move up one level in the directory tree. The contents of the Current Directory part of the window will change, and it is likely that the contents of the File List and the Directory List will also change. If you see "[MYDOCU~1]" (shorthand for "My Documents"[1]) in the Directory List, you can double click on it to

---

[1] The implementation language for PCAD2000 does not recognize file names with more than 8 characters in the file name or 3 characters in the extension. For files with longer names, Windows creates an "8.3"

make that the current directory. If it is not in the Directory List, double click on the "[..]" item again to continue moving up.

If you gave your sample file a name that did not end in ".SAM", you may change the Current Sample Name to show the ending you selected. For example, if your sample file is called SAMPLE.TXT, you should change the Current Sample Name to be "*.TXT" so that the File List will contain all files ending in ".TXT" If you have several different endings for sample files, you can change the Current Sample Name to "*.*" and see all of the files in the current directory.

Once you are in the proper Current Directory, and have set a proper Current Sample Name, you should see the name of your sample file in the File List. (It may be necessary to scroll through the list if there are more files than will fit in the File List window.) Click once on the name of your sample file to highlight it; then click on the Open Action Button at the upper right of the File Open window. This will open the file for scoring.

In guided execution mode, samples are scored on all scales (see Figure 4).
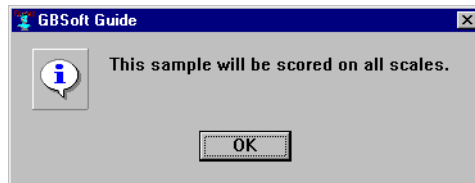
Figure 4: Scoring on All Scales

Selecting the Output Format

All output goes to the screen. In addition, the user may choose to send outputs to other destinations as well. After selecting the sample and confirming the scales, the user is presented with a list of possible output destinations (see Figure 5).
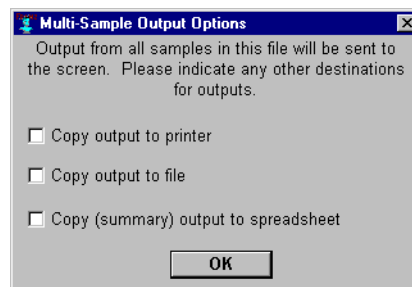
Figure 5: Specifying Outputs

There are three optional destinations. The user may choose none, one, two, or all three options by clicking in the check boxes next to the options. The options, and their effect, are described in the following paragraphs.

---

formatted name which is available in PCAD. Usually, this name will include the first six characters of the file name, followed by a tilde (~) and a number.

Copy Output to Printer

By choosing this option, the user requests that all output generated by the scoring process will be sent to the default printer. Printing will occur in parallel with output to the screen, subject to the following notes.

NOTE: Be aware that there are usually many pages of output generated by PCAD 2000. Your computer may be unavailable until the print job finishes, which could be a considerable time depending on the speed of your printer, your computer, and the size of the output. Generally speaking, GB Software recommends that you **Save** output to a file, then print that file when your computer and printer are not being heavily used.

NOTE: Printing output does not make a copy on disk. The only lasting record of the scoring session will be the hardcopy created by the printer.

Copy Output to File

By choosing this option, the user requests that all output generated by scoring process be saved in an output file on disk. An output file is created with the same name as the input sample file, and with an extension of **.OUT**. For example, the output from SAMPLE01.SAM (or SAMPLE01.TXT) will be saved in SAMPLE01.OUT. If there is already a file of the same name as the output file in the selected folder on the output disk, the existing file will be replaced with the new output file.

Once the output has been saved to a file, that file can be printed, edited, viewed on screen, or otherwise manipulated in any fashion appropriate to a pure ASCII text file.

Copy (Summary) Output to Spreadsheet

By selecting this option, the user chooses to save the scale summary output generated by the scoring process to a file in a format appropriate for input to a spreadsheet program. An output file is created with the same name as the input sample file, and with an extension of **.CSV** (for Comma Separated Values). For example, the output from SAMPLE01.SAM will be saved in SAMPLE01.CSV. If a CSV file of the same name already exists, then the output summary from this sample will be appended to the end of that file.

The spreadsheet file is in what is called "comma-separated value" format. For each item of interest, a label is put into the file (in quotations), followed by a comma, and the value of that item. Each item is on a separate line. An example generated by the TESTGB.SAM file is shown below.

```
"Name","Age","Education","Ethnicity","Sex","Word
Count","Correction Factor","Death Anxiety","Mutilation
Anxiety","Separation Anxiety","Guilt Anxiety","Shame
Anxiety","Diffuse Anxiety","Total Anxiety","Hostility
Out - Overt","Hostility Out - Covert","Total Hostility
Out","Hostility Inward","Ambivalent
Hostility","Schizophrenic","Cognitive
Impairment","Hope","Hopelessness","Self-
```

```
Accusation","Psychomotor Retardation","Somatic
Concerns","Death and Mutilation
Depression","Separation Depression","Hostility
Directed Outward","Total Depression",,"Death
Anxiety","Mutilation Anxiety","Separation
Anxiety","Guilt Anxiety","Shame Anxiety","Diffuse
Anxiety","Total Anxiety","Hostility Out -
Overt","Hostility Out - Covert","Total Hostility
Out","Hostility Inward","Ambivalent
Hostility","Schizophrenic","Cognitive
Impairment","Hope","Total Depression"
TEST,35,5,W,M,107,0.935,0.789,0.626,0.554,0.742,2.385,
0.671,2.489,0.873,0.575,0.965,0.859,0.717,-
3.647,0.195,1.237,0.319,2.604,0.250,0.330,0.798,0.554
,0.965,5.333,,0,0,0,0,2,0,2,0,0,0,0,0,3,0,1,1
```

Outputs Generated while Scoring the Sample File

At this point, the system will begin scoring the sample file. As scoring proceeds, the following outputs will be generated and sent to the screen (and to any other destinations selected by the user).

Scored Clauses

The initial output from every sample scoring session is a listing of clauses and the scores they are assigned. Each clause is printed on a line followed by one (or more) line(s) of scores, depending on what scales have been selected. The scored clauses will look something like those in Figure 6.
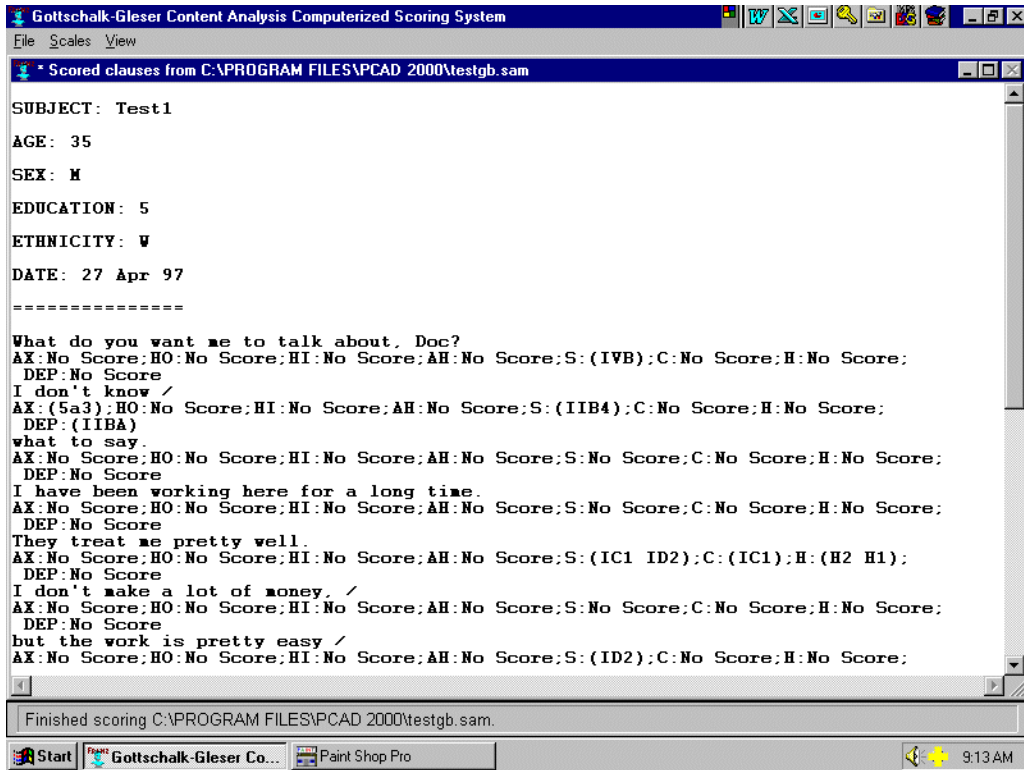
Figure 6: Example of scored clauses

If the sample is long enough, it will completely fill the space allocated for the on-screen listing. When this happens, the screen will clear, and then the remaining clauses and scores will be printed. The erased portion is stored off-screen, and can be retrieved later for printing or long-term storage.

When the basic scoring process is over, behavior will depend on the output options selected by the user at the beginning of scoring. If the user did not request output sent to the printer, a file, or a spreadsheet, the system will offer to stop, skipping all remaining output, or to continue (see Figure 7). If all you want is scored clauses, you may select the **Yes - Skip** button. To see other system outputs, select the **Show More** button. If you skip, you may print the output or save it to a disk file, but there is not yet enough information to generate a spreadsheet.
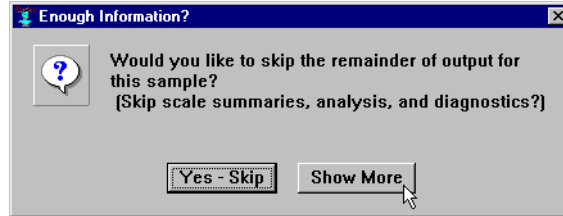
Figure 7: Choice after clauses are scored

Scale Summaries

If you chose to Show More, the system will open a window and place the summary sheets for each of the currently active scales in that window. The results will look something like Figure 8.
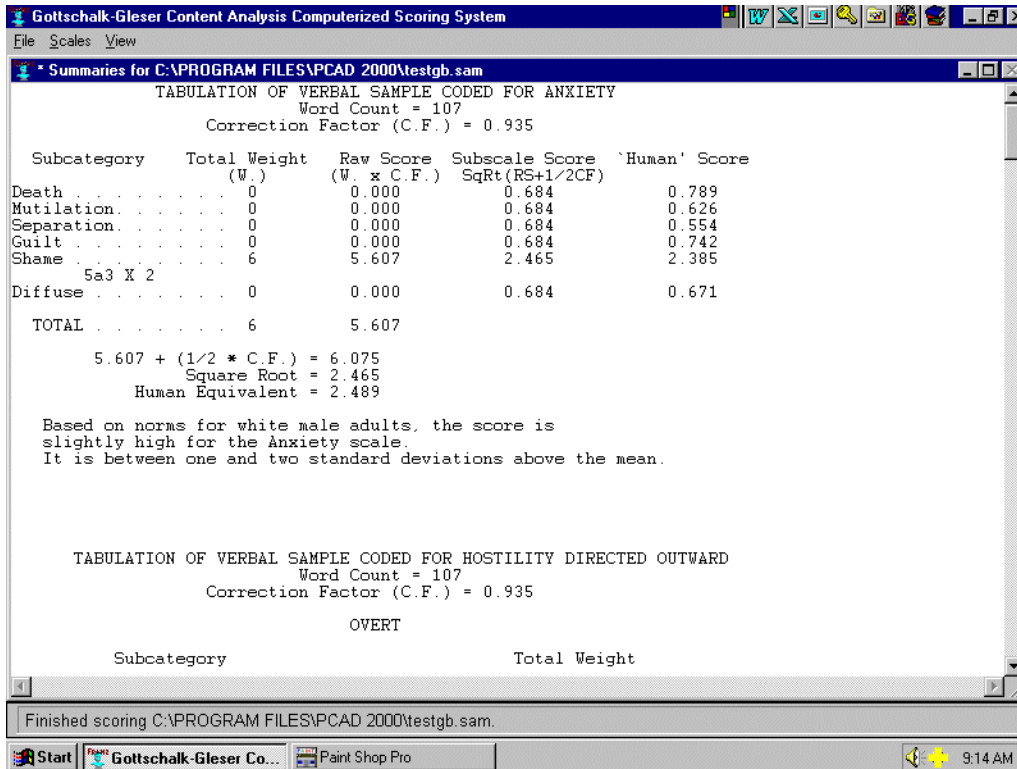
Figure 8: Example of scale summaries

After the summaries have been presented, the system will again offer to stop, skipping the remaining output (see Figure 9). If you are satisfied with the output so far (which can be sent to a printer, to a disk file, or saved in a spreadsheet), you may select the **Yes - Skip** button. To see other system outputs, select the **Show More** button.
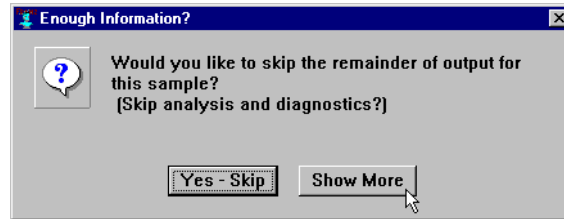
Figure 9: Selecting more output

Sample Analysis

If requested, PCAD 2000 provides a written analysis of the scoring results. This analysis includes important information about the limits and capabilities of the scoring system, and should be provided with any use of the system for diagnostic purposes. The analysis output will look something like that in Figure 10.
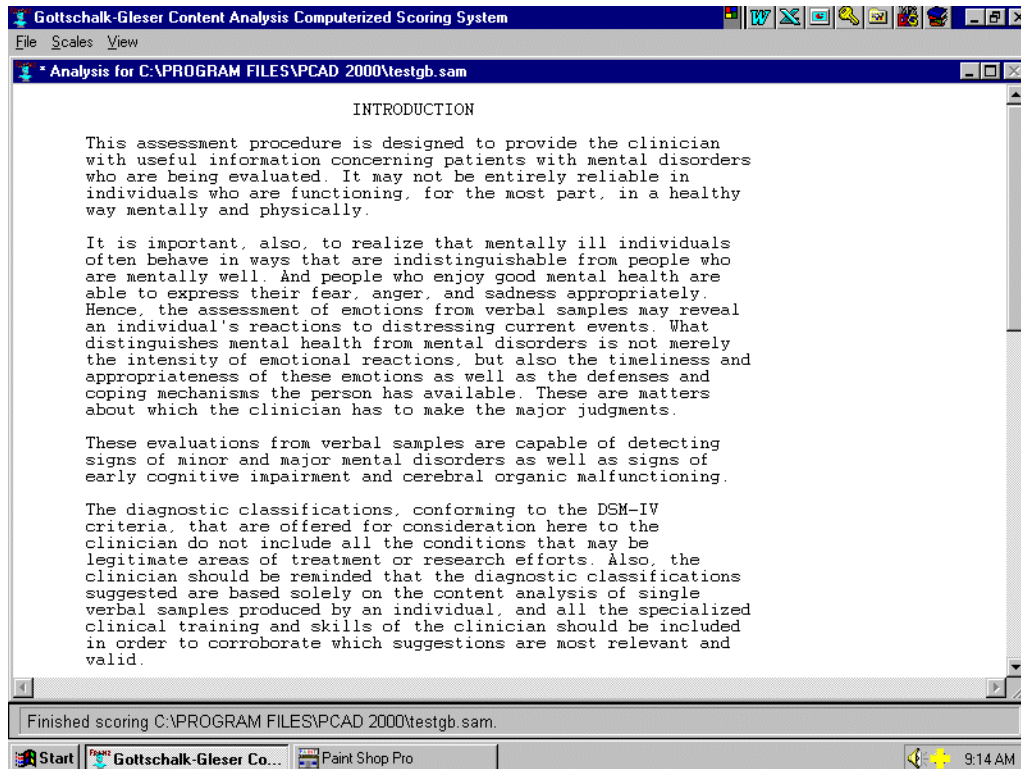
Figure 10: Example analysis output

Suggested Diagnosis

PCAD 2000 will, on request, produce a list of suggested DSM-IV diagnoses that should be considered by a clinician, as suggested by the scores generated from the sample.

Accompanying the suggested diagnoses are important information about mitigating factors that should also be considered, as well as some material regarding limitations of the system. Diagnostic output will typically look like that shown in Figure 11.
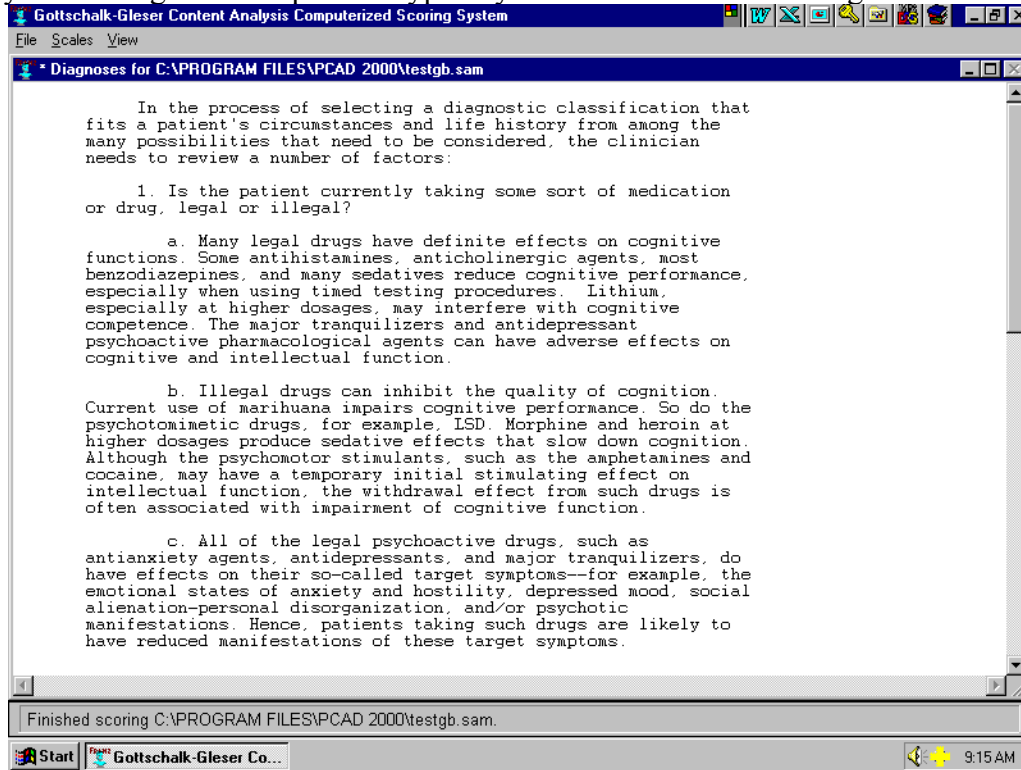
Figure 11: Example diagnostic output

After Scoring

After finishing with the sample and any additional outputs, guided execution offers the option of selecting another sample file and proceeding.
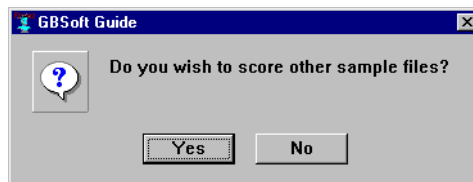
If you choose not to score another file, you will be asked if you wish to exit from the scoring system.
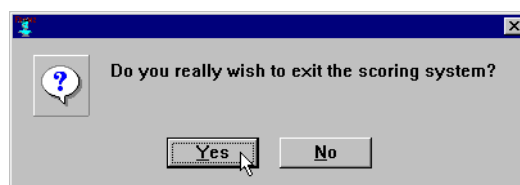
Selecting "Yes" will return you to the Windows desktop, while selecting "No" will leave you at the top level (unguided) of PCAD2000.

Actions after Leaving Guided Mode

After returning to the top level of the system, the system halts awaiting the user's next command. At this point, the user may use the **View** menu to revisit any of the output categories (see Figure 12). If the user chose to skip one or more of the output categories, the corresponding screen will be blank.
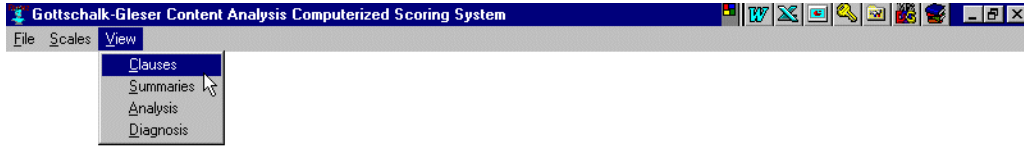
Figure 12: View menu for revisiting output on screen

If the user tries to select an output window from the **View** menu before any file has been scored, an error message will pop up and must be acknowledged by clicking on the **OK** button. See Figure 13 for an example of such an error notification.
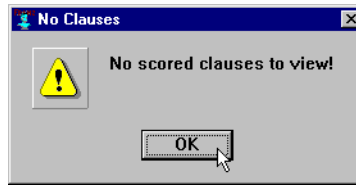
Figure 13: Error - output requested with no input

Exiting from PCAD 2000

To exit from PCAD 2000, select **Exit** from the **File** menu (see Figure 14).
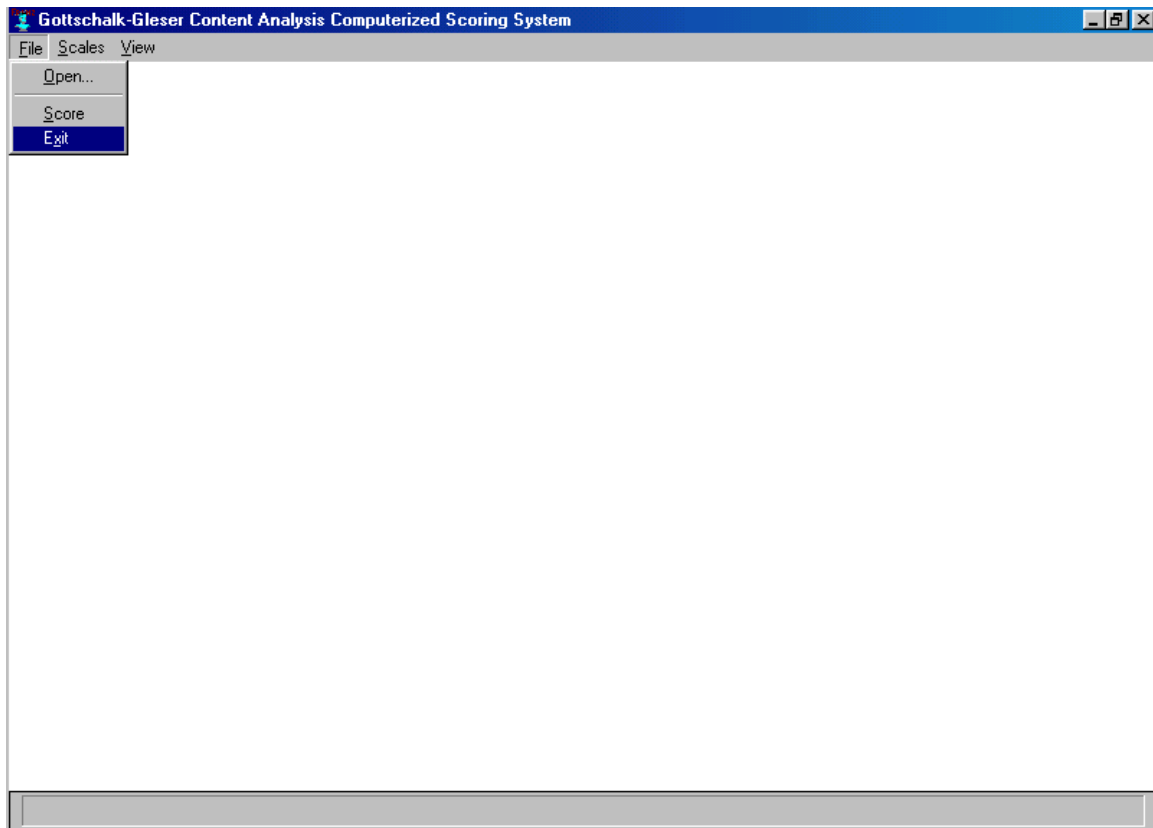
Figure 14: File Exit option

This will cause a confirmation window to appear (Figure 15).
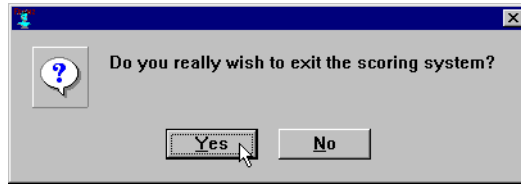
Figure 15: Exit confirmation

To complete your exit, click on the **Yes** button. Click on the **No** button if you wish to return to PCAD 2000.

Running PCAD 2000: Unguided Mode

Determining the Goals for a Session

PCAD2000 is a tool that can be used to support many different activities, in the same way that a word processor can be used for to prepare brief informal notes, to write complete books, and a whole host of writing tasks that fall between these extremes. Just as what kind of document you are preparing determines what features of your word processor you use in any one session, so may your overall project goals affect how you will use PCAD2000. Every user has different goals, and GB Software hopes that new uses will continue to be found for the capabilities of PCAD2000. However, most uses do tend to fall into one of two categories: those focused in detail on a single sample, and those primarily concerned with groups of samples, rather than the details of any one sample.

Clinical uses of PCAD2000 tend to focus on a small number of samples in great detail. For example, a therapist might elicit a verbal sample from a client at each meeting, scoring each sample as it is collected, and using the analytical and diagnostic results to confirm and cross-check the professional judgments being made based on other criteria. Scoring single samples from a single subject over time can also be helpful in monitoring the efficacy of a particular therapeutic regime. A clinician could use a single sample from a new client as a fast and inexpensive screening test for cognitive impairment, with more extensive testing scheduled if PCAD2000 indicates an elevated score.

Forensic uses also tend to collect a very small set of samples and utilize PCAD2000 to provide very fine-grained analyses specific to particular cases.

Research uses, on the other hand, tend to involve large numbers of samples and generally do not use the analytic and diagnostic features of PCAD2000. Instead, they usually rely on scale summaries to allow statistical characterization of the phenomenon under study. For example, in a drug study, verbal samples may be obtained from all subjects and the summary scale data used to determine whether or not the drug under study reduces anxiety. To support this type of use, PCAD2000 supports output of scale summary information in a format that is acceptable for input to the Excel spreadsheet program.

Starting the Scoring System

Click on the Start button, select Programs, then locate the PCAD2000 folder (under whatever name you gave it). Selecting this folder should offer a submenu with Scoring as one of the choices. Click on Scoring to launch the program.

After PCAD2000 has started, you will need to acknowledge the copyright and credit box by clicking on its "OK" button.
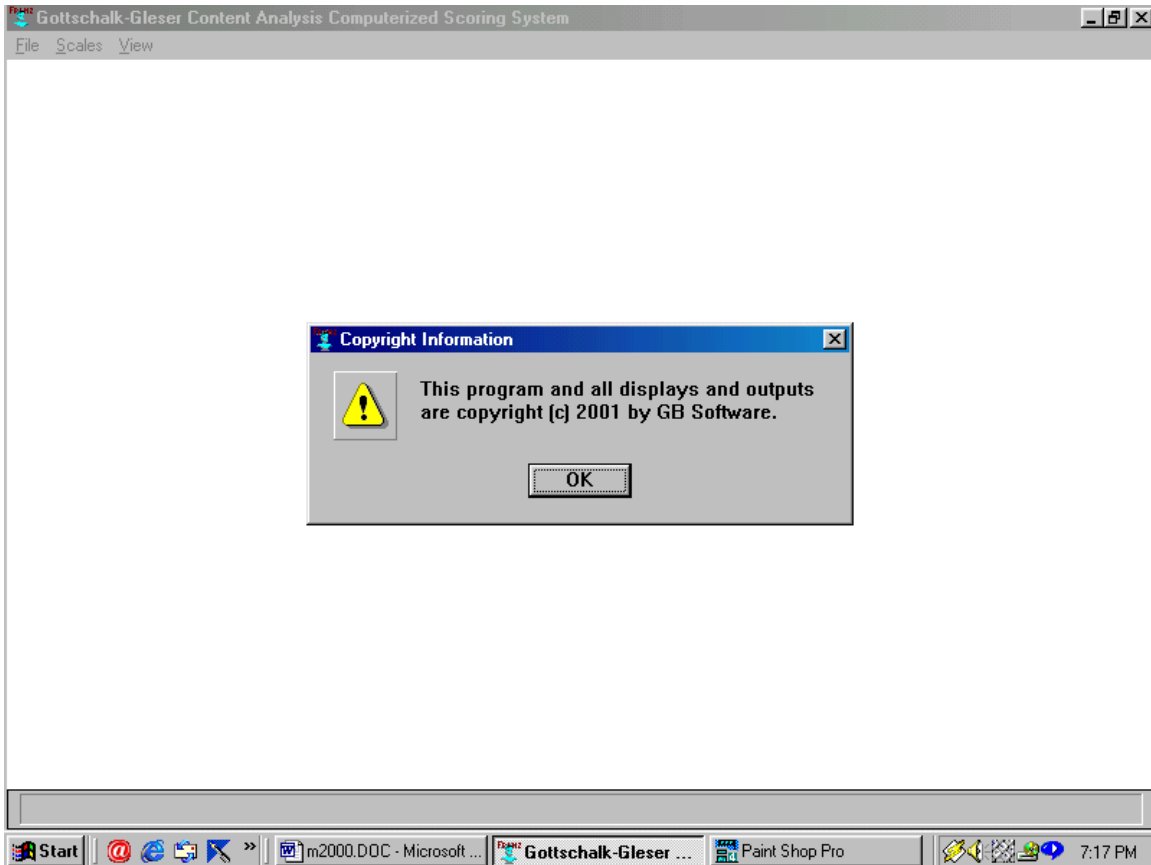
Selecting the Scales to Use

There is a top-level menu item titled "**Scales**". Each of the available scales is listed on this menu, and there are two additional choices: **Set All Scales** and **Clear All Scales**.
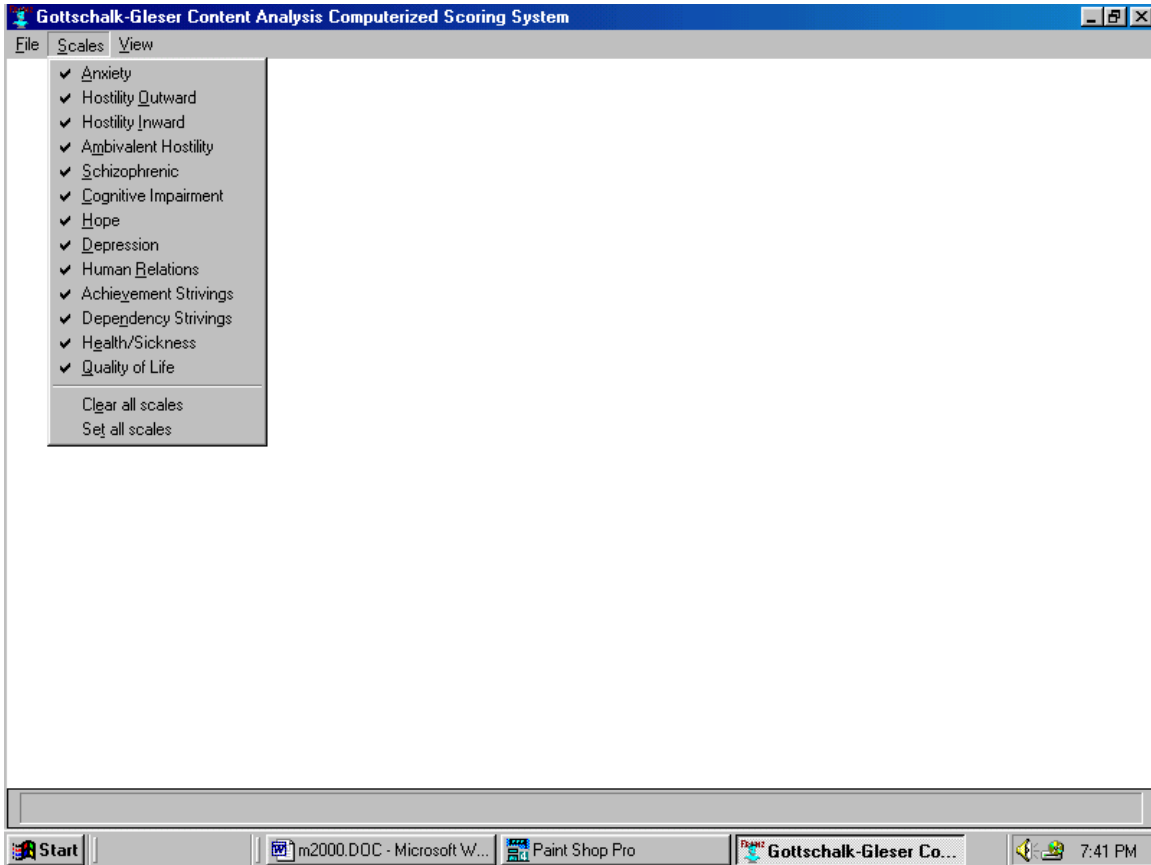
- Clicking on a scale name without a check next to it inserts a check mark and that scale to the list of scales that will be scored. Clicking on the name of a scale with a check mark will remove the mark and delete the scale from the list of scales to be scored.
- Clicking on **Clear All Scales** turns off all scoring.
- Clicking on **Set All Scales** turns on all scales for scoring.

Whenever an item in this menu is selected, a message appears in the message area at the bottom of the PCAD 2000 window showing what scales are currently enabled.

Selecting a Sample File to Score

To select a sample file to be scored, click on **File** in the menu bar at the top of the screen, then on **Open**. This will cause a file selection dialog box to open.
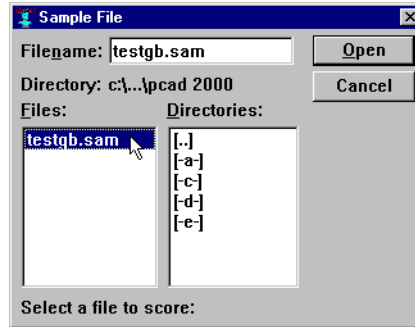
Selecting a sample file may require some interaction with the "Sample File" dialog box. There are several components to this box, as shown below.
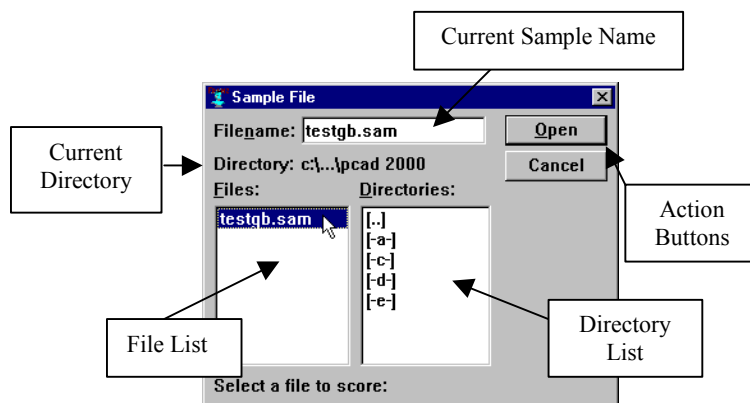
When you first begin to open a file, the Current Directory will probably be shown as "c:\…\pcad2000". Unless you have stored sample files in this directory, the only samples shown in the File List will be the examples included with PCAD 2000. The Current Sample Name will probably be "*.SAM", and the directory list will probably look as it does in the figure above.

To move to the directory where you saved your sample, you will need to maneuver through the directory tree. You do this by using the Directory List. For example, if you save your samples in the directory "C:\My Documents", you could move to that directory by first double-clicking on the "[..]" entry at the top of the Directory List. This tells PCAD 2000 to move up one level in the directory tree. The contents of the Current Directory part of the window will change, and it is likely that the contents of the File List and the Directory List will also change. If you see "[MYDOCU~1]" (shorthand for "My Documents"[2]) in the Directory List, you can double click on it to make that the current directory. If it is not in the Directory List, double click on the "[..]" item again to continue moving up.

---

[2] The implementation language for PCAD2000 does not recognize file names with more than 8 characters in the file name or 3 characters in the extension. For files with longer names, Windows creates an "8.3" formatted name which is available in PCAD. Usually, this name will include the first six characters of the file name, followed by a tilde (~) and a number.

If you gave your sample file a name that did not end in ".SAM", you may change the Current Sample Name to show the ending you selected. For example, if your sample file is called SAMPLE.TXT, you should change the Current Sample Name to be "*.TXT" so that the File List will contain all files ending in ".TXT" If you have several different endings for sample files, you can change the Current Sample Name to "*.*" and see all of the files in the current directory.

Once you are in the proper Current Directory, and have set a proper Current Sample Name, you should see the name of your sample file in the File List. (It may be necessary to scroll through the list if there are more files than will fit in the File List window.) Click once on the name of your sample file to highlight it, then click on the **Open** Action Button at the upper right of the File Open window. This will open the file for scoring.

Clicking the **Cancel** button will close the file selection dialog without changing the currently selected file.

Start the Scoring Process

To start the scoring process, simply select **Score** from the **File** menu. If no sample file has been selected, an error message will pop up, and you will have to acknowledge the error (by clicking on the **OK** button) before continuing.
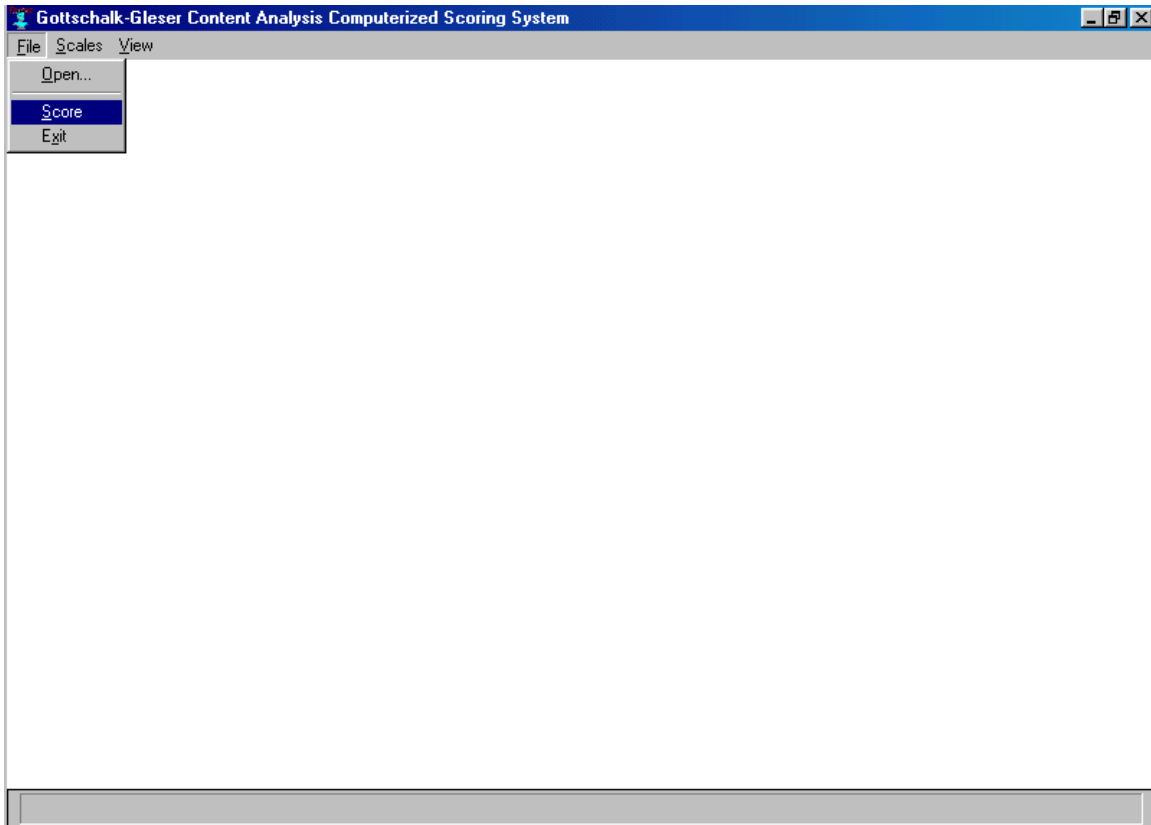
After confirming that the selected sample file exists, PCAD 2000 next offers the user an ability to specify where outputs should be sent.

Selecting the Output Format

All output from scoring goes to the screen. In addition, the user may choose to send outputs to other destinations as well. After selecting the sample and confirming the scales, the user is presented with a list of possible output destinations (see Figure 16).
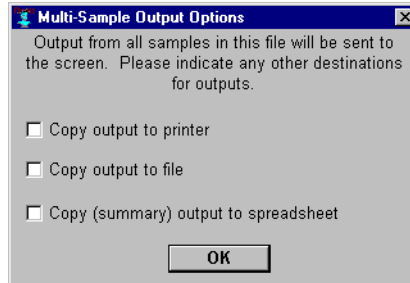
Figure 16: Specifying Outputs

There are three optional destinations. The user may choose none, one, two, or all three options by clicking in the check boxes next to the options. The options, and their effect, are described in the following paragraphs.

Copy Output to Printer

By choosing this option, the user requests that all output generated by the scoring process will be sent to the default printer. Printing will occur in parallel with output to the screen, subject to the following notes.

NOTE: Be aware that there are usually many pages of output generated by PCAD 2000. Your computer may be unavailable until the print job finishes, which could be a considerable time depending on the speed of your printer, your computer, and the size of the output. Generally speaking, GB Software recommends that you **Save** output to a file, then print that file when your computer and printer are not being heavily used.

NOTE: Printing output does not make a copy on disk. The only lasting record of the scoring session will be the hardcopy created by the printer.

Copy Output to File

By choosing this option, the user requests that all output generated by scoring process be saved in an output file on disk. An output file is created with the same name as the input sample file, and with an extension of **.OUT**. For example, the output from SAMPLE01.SAM (or SAMPLE01.TXT) will be saved in SAMPLE01.OUT. If there is already a file of the same name as the output file in the selected folder on the output disk, the existing file will be replaced with the new output file.

Once the output has been saved to a file, that file can be printed, edited, viewed on screen, or otherwise manipulated in any fashion appropriate to a pure ASCII text file.

Copy (Summary) Output to Spreadsheet

By selecting this option, the user chooses to save the scale summary output generated by the scoring process to a file in a format appropriate for input to a spreadsheet program. An output file is created with the same name as the input sample file, and with an extension of **.CSV** (for <u>C</u>omma <u>S</u>eparated <u>V</u>alues). For example, the output from SAMPLE01.SAM will be saved in SAMPLE01.CSV. If a CSV file of the same name already exists, then the output summary from this sample will be appended to the end of that file.

The spreadsheet file is in what is called "comma-separated value" format. For each item of interest, a label is put into the file (in quotations), followed by a comma, and the value of that item. Each item is on a separate line. An example generated by the TESTGB.SAM file is shown below.

```
"Name","Age","Education","Ethnicity","Sex","Word
Count","Correction Factor","Death Anxiety","Mutilation
Anxiety","Separation Anxiety","Guilt Anxiety","Shame
Anxiety","Diffuse Anxiety","Total Anxiety","Hostility
Out - Overt","Hostility Out - Covert","Total Hostility
Out","Hostility Inward","Ambivalent
Hostility","Schizophrenic","Cognitive
Impairment","Hope","Hopelessness","Self-
Accusation","Psychomotor Retardation","Somatic
Concerns","Death and Mutilation
Depression","Separation Depression","Hostility
Directed Outward","Total Depression",,"Death
Anxiety","Mutilation Anxiety","Separation
Anxiety","Guilt Anxiety","Shame Anxiety","Diffuse
Anxiety","Total Anxiety","Hostility Out -
Overt","Hostility Out - Covert","Total Hostility
Out","Hostility Inward","Ambivalent
Hostility","Schizophrenic","Cognitive
Impairment","Hope","Total Depression"
TEST,35,5,W,M,107,0.935,0.789,0.626,0.554,0.742,2.385,
0.671,2.489,0.873,0.575,0.965,0.859,0.717,-
3.647,0.195,1.237,0.319,2.604,0.250,0.330,0.798,0.554
,0.965,5.333,,0,0,0,0,2,0,2,0,0,0,0,0,3,0,1,1
```

A picture of the Excel program with a PCAD2000 file loaded is shown below:

Outputs from the Scoring Process

Scored Clauses

> The initial output from every sample scoring session is a listing of clauses and the scores they are assigned. Each clause is printed on a line followed by one (or more) line(s) of scores, depending on what scales have been selected. The scored clauses will look something like those in Figure 17.
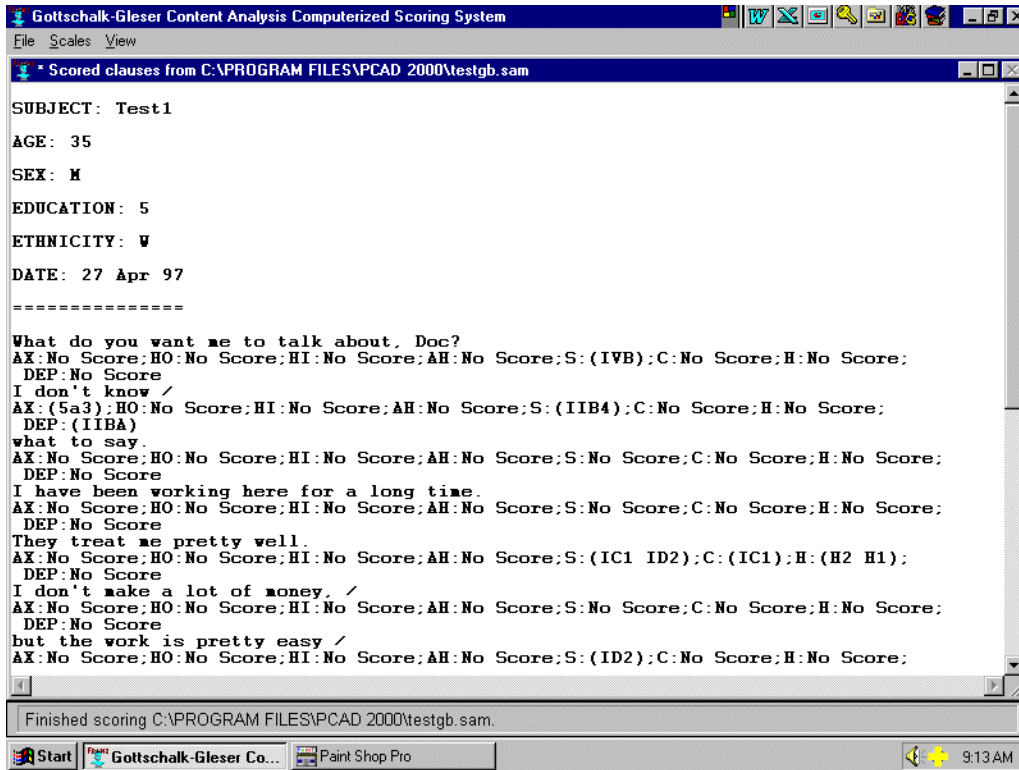
Figure 17: Example of scored clauses

If the sample is long enough, it will completely fill the space allocated for the on-screen listing. When this happens, the screen will clear, and then the remaining clauses and scores will be printed. The erased portion is stored off-screen, and can be retrieved later for printing or long-term storage.

When the basic scoring process is over, behavior will depend on the output options you selected at the beginning of scoring. If you did not send output to the printer, a file, or a spreadsheet, the system will offer to stop, skipping all remaining output, or to continue (see Figure 18). If all you want is scored clauses, you may select the **Yes - Skip** button. To see other system outputs, select the **Show More** button. If you skip, you may print the output or save it to a disk file, but there is not yet enough information to generate a spreadsheet.
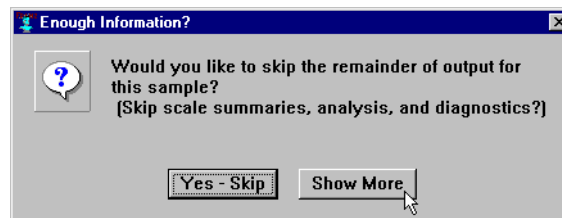
Figure 18: Choice after clauses are scored

Scale Summaries

If you chose to Show More, the system will open a window and place the summary sheets for each of the currently active scales in that window. The results will look something like Figure 19.
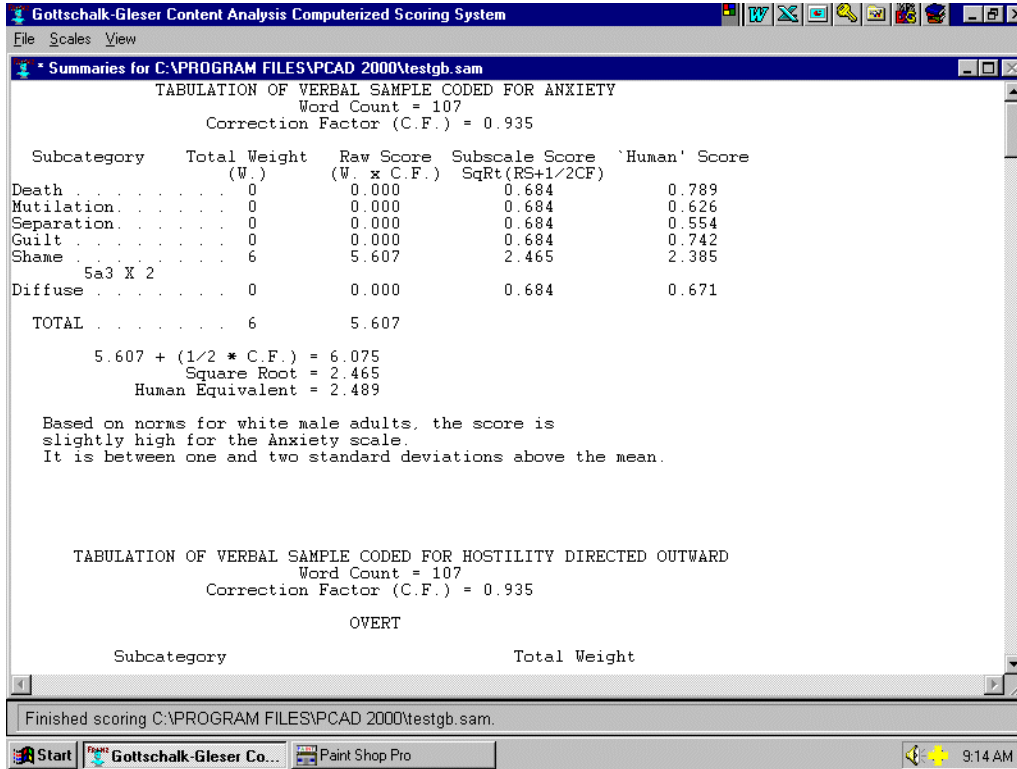
Figure 19: Example of scale summaries

After the summaries have been presented, the system will again offer to stop, skipping the remaining output (see Figure 20). If you are satisfied with the output so far (which can be sent to a printer, to a disk file, or saved in a spreadsheet), you may select the **Yes - Skip** button. To see other system outputs, select the **Show More** button.
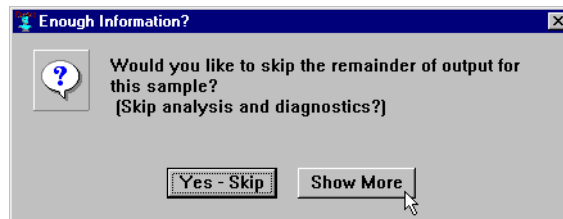
Figure 20: Selecting more output

Sample Analysis

If requested, PCAD 2000 provides a written analysis of the scoring results. This analysis includes important information about the limits and capabilities of the scoring system, and should be provided with any use of the system for diagnostic purposes. The analysis output will look something like that in Figure 21.
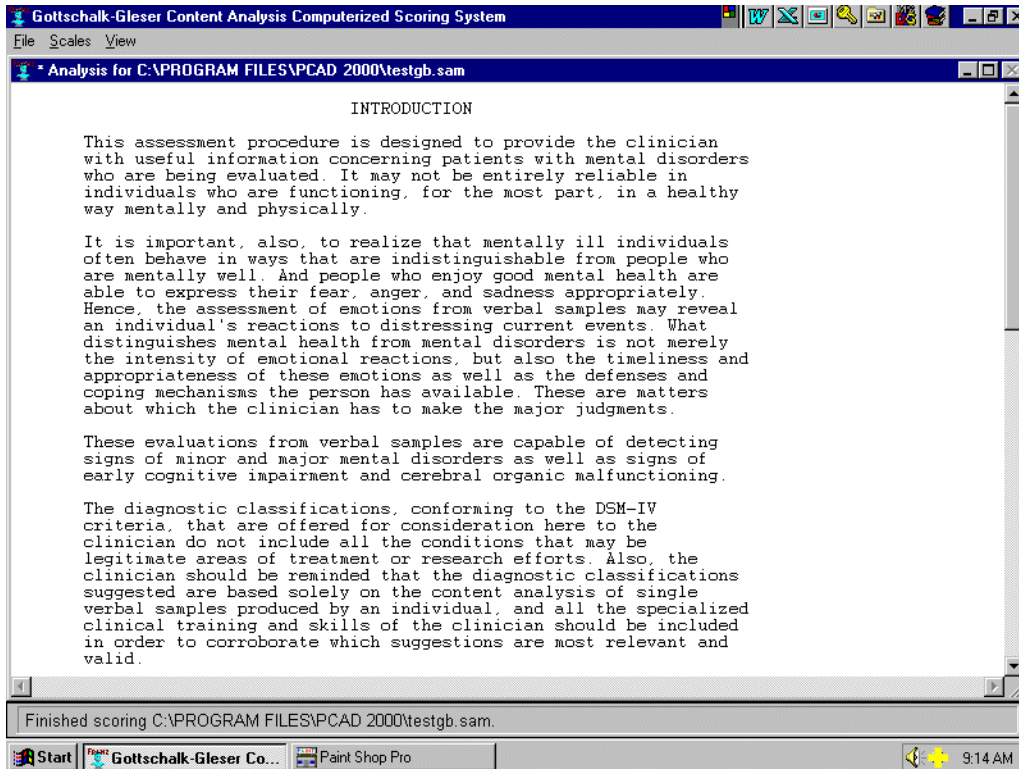
Figure 21: Example analysis output

Suggested Diagnosis

PCAD 2000 will, on request, produce a list of suggested DSM-IV diagnoses that should be considered by a clinician, as suggested by the scores generated from the sample. Accompanying the suggested diagnoses are important information about mitigating factors that should also be considered, as well as some material regarding limitations of the system. Diagnostic output will typically look like that shown in Figure 22.
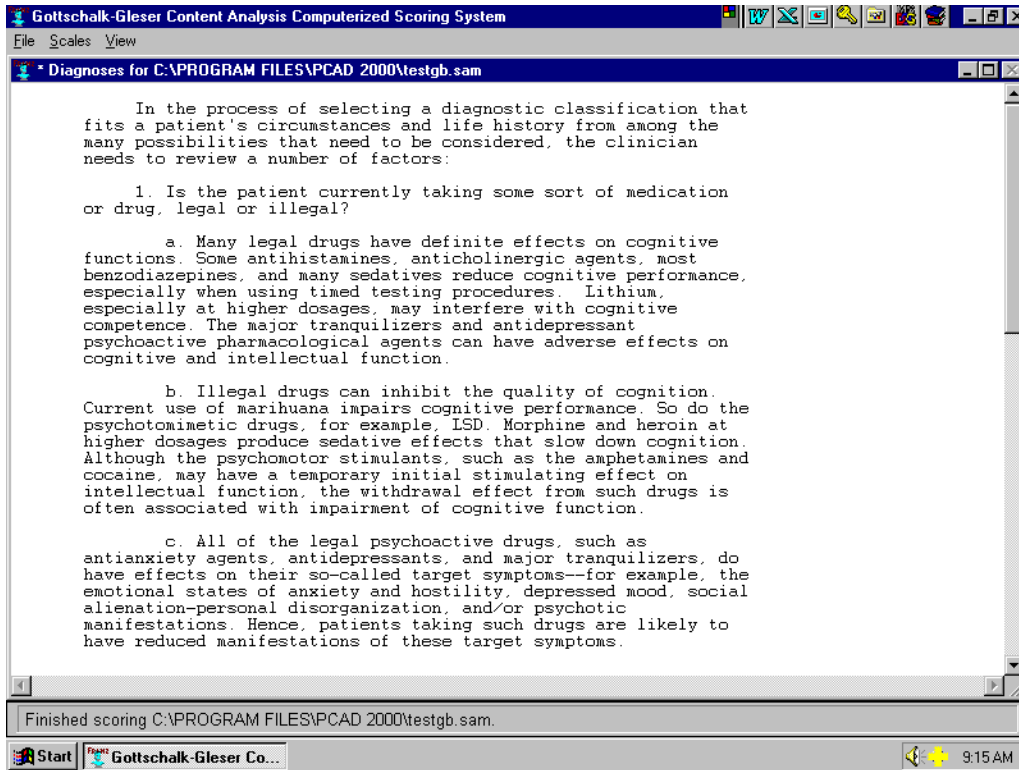
Figure 22: Example diagnostic output

After returning to the top level of the system, the system halts awaiting the user's next command. At this point, the user may use the **View** menu to revisit any of the output categories (see Figure 23). If the user chose to skip one or more of the output categories, the corresponding screen will be blank.
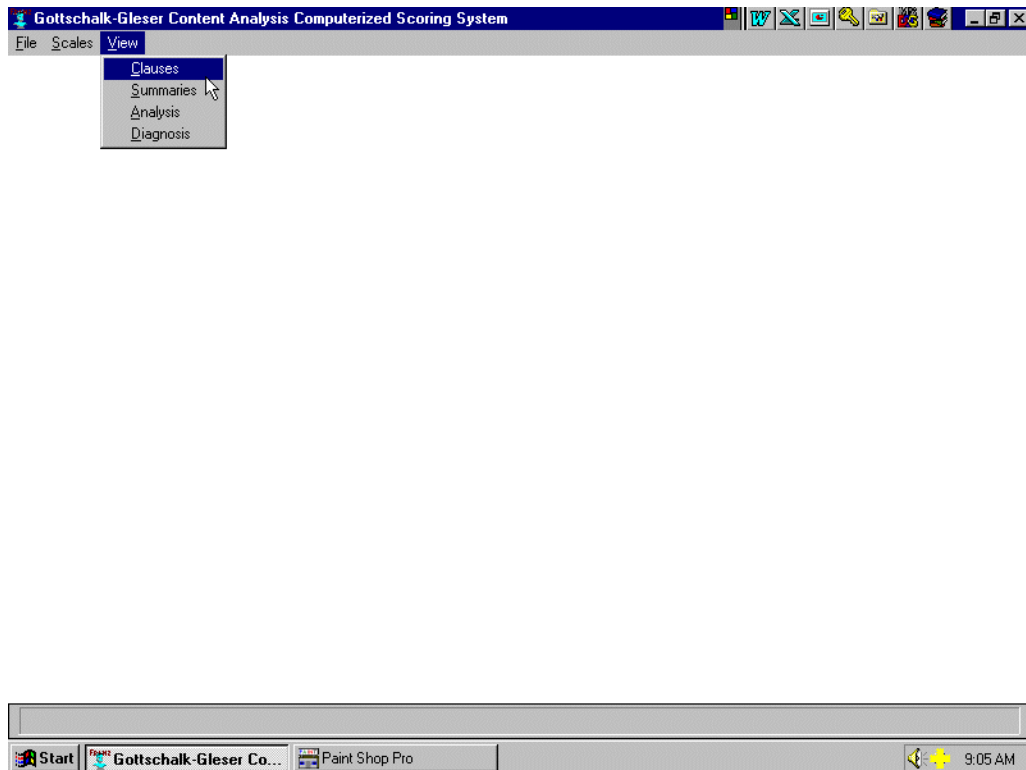
Figure 23: View menu for revisiting output on screen

If the user tries to select an output window from the **View** menu before any file has been scored, an error message will pop up and must be acknowledged by clicking on the **OK** button. See Figure 24 for an example of such an error notification.
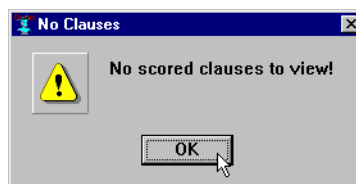
Figure 24: Error - output requested with no input

Exiting from PCAD 2000

To exit from PCAD 2000, select **Exit** from the **File** menu (see Figure 25).
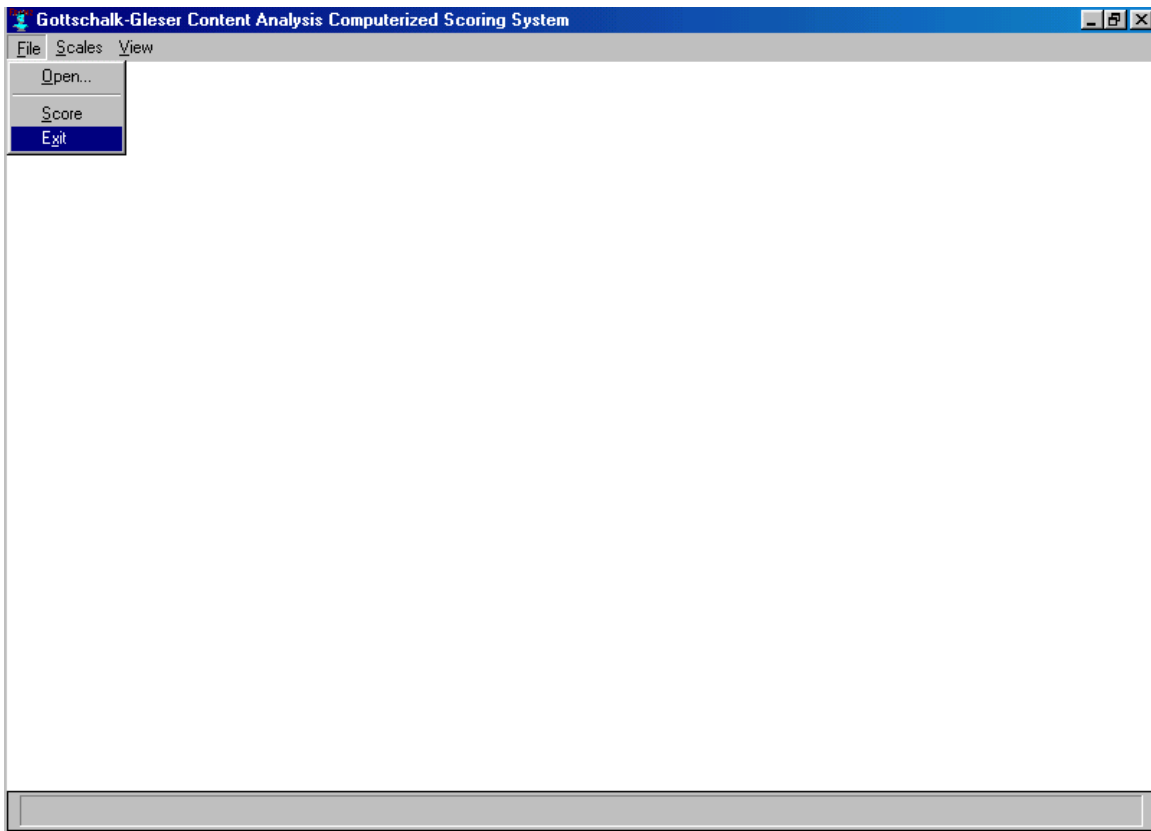
Figure 25: File Exit option

This will cause a confirmation window to appear (Figure 26).
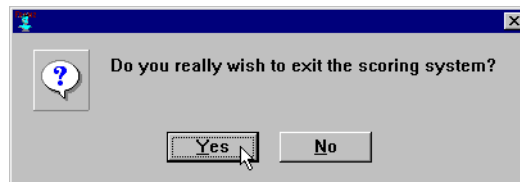
Figure 26: Exit confirmation

To complete your exit, click on the **Yes** button. Click on the **No** button if you wish to return to PCAD 2000.

Theoretical Background and Development

Introduction

The Gottschalk-Gleser Content Analysis Method for measuring the magnitude of various psychobiological states and traits from the content analysis of verbal behavior has been successfully applied to many different neuropsychiatric dimensions. Extensive empirical research has established the validity and reliability of Scales measuring a variety of emotional and psychobiological states including Anxiety (including Death, Mutilation, Separation, Guilt, Shame, and Diffuse Anxiety subscales), Hostility Outward (including Overt Hostility, Covert Hostility, and Total Hostility Outward subscales), Hostility Inward, Ambivalent Hostility (hostility originating externally and directed towards the self), Social Alienation-Personal Disorganization, Cognitive Impairment, Hope, Depression (including 7 subscales), Human Relations, Achievement Strivings, Dependency Strivings, and Health/Sickness.

While the utility of these Scales has been demonstrated repeatedly through decades of research, widespread everyday use of content analysis of verbal behavior for research and clinical practice has been hampered by the relatively high training and performance requirements associated with the manual application of the technique. For example, Gottschalk and Gleser [1969] recommend an inter-coder reliability coefficient of 0.80 or better with the scoring of qualified experts in the use of these content analysis Scales. To achieve this level of familiarity and skill in coding these Scales requires some practice with previously published and unpublished examples of scoring these content analysis Scales and continual monitoring of trained scorers. Manual scoring is also not a particularly quick process, requiring not only trained content judgments, but also extensive post-processing of scores to prepare Scale-based summaries and analyses.

To address the training and performance obstacles to wider use of the Scales, GB Software has developed and tested computer program software that is capable of reliably scoring computer-readable transcriptions of verbal (speech) samples on the Scales named above. In operation, the program assigns scores on the user-selected Scales to each clause in the input sample, then, at the user's option, reports score summaries for each scored Scale with comparisons to established norms for the subject's demographic group, provides an analysis of the score profile, and suggests possible diagnoses drawn from the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV).

Brief Descriptions of the Content Analysis Scales

The full definition of each of the scales available for computerized scoring is given in Appendix A. This section provides a narrative description of the various scales. Reliability and validity studies for each of these scales have been published in the literature, and references are available either from GB Software or from our Web page.

Anxiety Scale

The type of anxiety that this Scale measures is what could be termed "free" anxiety in contrast to "bound" anxiety, which manifests itself in psychobiological mechanisms of conversion and hypochondriacal symptoms, in compulsions, in doing and undoing, in withdrawal from human relationships, and so forth. Some aspects of bound anxiety are registered by this Scale, particularly by means of displacement and denial. This type of bound anxiety is relatively accessible to consciousness, usually in defensive form and is capable, along with grossly conscious "free" anxiety feelings, of activating autonomic nervous system and central nervous system signs of arousal..

On the basis of clinical observation the Anxiety Scale is classified into six subtypes: *death*, *mutilation*, *separation*, *guilt*, *shame*, and *diffuse* or *non-specific anxiety*. Fear of death is assessed by those content items dealing directly with death and destruction. Mutilation anxiety is synonymous with "castration" anxiety, and the descriptive items in the Scale pertaining to this subtype of anxiety are derived from clinical psychoanalytic psychology. The concept of separation anxiety and the descriptive items designating what references in speech are to be included under this heading are also derived from psychoanalytic psychology. The descriptive items differentiating shame from guilt anxiety distinguish shame through verbal references to ridicule, inadequacy, embarrassment, humiliation, exposure of shortcomings or details of a person's private life, and distinguish guilt through verbal references to adverse criticism, abuse, condemnation , or moral disapproval, especially based on internalized attitudes or values. Diffuse or non-specific anxiety is the category of anxiety in the Scale where it is impossible to distinguish the type of anxiety-fear which is being verbalized.

Hostility Scales

The *Hostility Scales* are designed to measure three types of hostility of a transient, rather than sustained, affect. The hostility scores derived from several verbal samples obtained from the same individual will provide a trait-like measure.

The *Hostility Directed Outward* Scale measures the intensity of adversely critical, angry, assaultive, asocial impulses and drives towards objects outside oneself.

The *Hostility Directed Inward* Scale measures degrees of self-hate and self-criticisms and, to some extent, feelings of anxious depression and masochism.

The *Ambivalent Hostility* Scale, though derived from verbal communications suggesting destructive and critical thoughts or actions of others to the self, also measures not only some aspects of hostility directed inward, but at the same time some features of hostility directed outwards.

All three hostility scales assign higher weights to scorable verbal statements communicating hostility that, by inference, is more likely to be strongly experienced by the speaker; whereas, completely repressed hostility is not scored.

Social Alienation-Personal Disorganization Scale

This Scale was originally designed to measure the relative degree of personal disorganization, social alienation, and isolation of schizophrenic patients. The common denominators of the schizophrenic syndrome are considered to be disturbances in the coherence and logicality of thinking processes and disturbances in human relationships, especially in the form of withdrawal, avoidance, and antagonism. Another principal characteristic of this concept of the schizophrenic syndrome is that it is a phenomenon quantitatively describable, that is, there are relative degrees of severity of schizophrenia and, in some schizophrenic individuals, severity can fluctuate considerably from day-to-day. This concept of the schizophrenic syndrome, in fact, holds that these principal, and characteristic features of schizophrenia -- social alienation and personal disorganization -- are present to a varying extent in non-schizophrenic individuals but not in such a continuous and/or extreme fashion as in schizophrenia.

Cognitive and Intellectual Impairment Scale

The Cognitive and Intellectual Impairment Scale is designed to measure transient and reversible changes in cognitive and intellectual functions as well as permanent and irreversible changes, all due principally to brain dysfunction and minimally to transient emotional changes in the individual.

Hope Scale

The Hope Scale is designed to measure the intensity of the optimism that a favorable outcome is likely to occur, not only in one's personal earthly activities, but also to cosmic phenomena and even in spiritual or imaginary events. The favorable outcome is intended to denote one which might lead to human survival, the preservation or enhancement of health, the welfare or constructive achievement of the self or any part of mankind.

Depression Scale

This Depression Scale, derived from verbal samples, provides measurement dimensions compatible with the concept that there are a number of potentially relevant subcategories of the construct of depression which have significant statistical relationships with different underlying pathogenic processes. Thus, in addition to providing a total score, it has a broad range of phenomenological subscales. These are:

  I. Hopelessness.
  II. Self-Accusation.
  III. Psychomotor Retardation.
  IV. Somatic Concerns.
  V. Death and Mutilation Depression.

VI. Separation Depression.
VII. Hostility Outward.

Human Relations Scale

This scale provides a quantitative estimate of an individual's degree of interest in and his capacity for constructive, mutually productive, or satisfying human relationships. The impetus for developing this scale has stemmed from the clinical impression that the relative magnitude of such a capacity or need has often seemed to be an important factor in how a patient responds to brief psychotherapy, or how successfully a person is advancing in a career involving mutual collaboration and dependence on other people, or even how successfully one learns at school from other people.

Achievement Strivings Scale

The purpose of this scale is to provide a means to assess both the transient swings and typical levels of motivation toward achievement and also the relative magnitude of reactions of frustration in this drive. We have not found content categories which can cover achievement strivings and accomplishments relevant to all possible fields of endeavor, since vocational and avocational strivings may be differentially pertinent, and since one person's vocation may be another person's avocation. It may be necessary to specify the achievement goals of the subjects studied to assess them meaning of any findings.

Dependency Strivings Scale

The purpose of this scale is to provide a means to assess both the transient swings and typical levels of motivation toward dependency and also the relative magnitude of reactions of frustration in this drive.

Health-Sickness Scale

This Scale distinguishes references to good and bad health, and reports each separately, together with a combined measure of total references to health issues.

Quality of Life Scale

This Scale is a composite of several other scales, and attempts to represent a measure of the overall quality (positive or negative) of the subject's life, as revealed in the sample.

Rationale

A clinician has several options in obtaining objective and valid clinical evaluations. For example, precision and accuracy may be avoided and impressionistic reactions and "gut feelings" can be relied on; some clinicians feel they are able to do competent clinical work with this approach. Or a clinician can spend considerable time and care in the diagnostic and therapeutic evaluation of children and adults with the goal of assessing accurately and precisely the magnitude of diverse psychopathological processes within patients at different times. Another approach is to use various observer psychiatric rating scales, such as the Brief Psychiatric Rating Scale, the Hamilton Anxiety or Depression Rating scales or various self-report measures, such as, various adjective checklists. Although such measures are widely used in many research projects, their use carries with them a false sense of security since quite often no inter-rater reliability tests are done with the rating scales, the assumption being that anybody can follow the instructions for rating and no measurement errors are likely to occur. With rating scales, however, raters vary widely on how much of the range of ratings they use with the same subjects, and some raters characteristically select the lower range of the ratings; whereas others habitually chose the higher range of the ratings. With self-report measures, though it is true that the self-rating comes directly from the individual being evaluated, the assumption is that self-raters are all, indeed, in good and equivalent contact with themselves and are not likely to be falsifying, consciously or unconsciously, their self-evaluations.

These kinds of measurement errors in observer rating scales and self-report scales, usually disregarded by researchers and clinicians, are minimized in the measurement method of content analysis of verbal behavior. For the subjects being rated are usually not aware what speech content or form is being analyzed and have difficulty covering up, even if they have some notions about such matters. Furthermore, the unstructured approach customarily used to elicit speech avoids the questionnaire or "prosecuting attorney" method, and allows the subject to elaborate and use free-will to the extent desired by the self on choice of topics to verbalize. Emotions, self-reflections, doubts, and defensive maneuvers are recorded, and these all contribute to the content analysis scores eventually calculated. The content analysis approach to the measurement of psychological dimensions includes the strengths of both the self-report approach and the observer rating scale approach, and minimizes the weaknesses of both in terms of measurement errors.

Development of the Scales

The development of an objective and reliable method of measuring the magnitude of various psychological dimensions from natural language was motivated by the recognition that diagnosticians and therapists use speech as the major source of information. In doing so, they assess how and what is said in an impressionistic manner that allows for a relatively high likelihood of distortion and/or error from potentially incorrect empathic responses and inferences during the process of evaluating the subject's talk. How to minimize such error variance and how to maximize the uniformity and consistency of the inferential evaluations concerning the speaker's subjective experience

and the relative magnitude of these psychological states and conflicts became a compelling aim. In the process of probing the emotional reactions of subjects or patients, an effort was made to minimize reactions of guarding or covering. Hence the instructions to elicit speech from subject were purposely relatively ambiguous and non-structured. Speakers were asked to tell about personal or dramatic life experiences. From such standardized instructions it was found possible to compare individuals in a standard context so that demographic and personality variables could be explored and investigated, while holding relatively constant the influence of such variables as the instructions for eliciting speech, the nature and personality of the interviewer, the context, and the situation. The effects of varying these non-interviewee variables have been subsequently investigated, one by one, after reliable and valid content analysis scales were developed.

The development of the Gottschalk-Gleser method of content analysis has involved a long series of steps.

1. It has required that the psychological dimensions to be measured (for example, anxiety, hostility outward, hostility inward, cognitive and intellectual impairment, social alienation-personal disorganization, depression, and hope) be precisely defined,
2. that the lexical cues be carefully pinpointed by which a receiver of any verbal messages infers the occurrence of any of these psychological states,
3. and the linguistic, principally syntactic, cues conveying intensity (for example, the word "very" in the proper context) be specified.
4. Next differential weights were assigned to these semantic and linguistic cues conveying the magnitude of a subjective experience whenever appropriate.
5. Furthermore, a systematic means had to be arrived at for correcting for the number of words spoken per unit of time so that one individual could be compared to himself on different occasions or to others with regards to the magnitude of any particular psychological state.
6. A series of weighted thematic categories had to be specified for every psychological dimension to be measured and
7. research technicians were trained to score these typescripts of human speech according any one scale an at inter-scorer reliability of 0.80 or above.
8. Moreover, a set of construct-validation studies had to be carried out to recheck exactly what each content analysis scale measured, and these validation studies have included the use of four kinds of criterion measures: psychological, physiological, pharmacological, and biochemical.
9. On the basis of these construct-validation studies, changes have been made in the content categories and their assigned weights of each specific scale, in the direction of maximizing the correlations between the content analysis scores with these various independent criterion measures.

The theoretical framework from which this measurement approach has been developed has been an eclectic one and has included behavioral and conditioning theory, psychoanalytic clinic theory, and linguistic theory. In addition, the formulation of these psychological states has been deeply influenced by the position that they all have

biologic roots. Both the definition of each separate psychological scale and the selection of the specific verbal content items used as cues for inferring each dimension have been influenced by the decision that whatever psychological dimension is measured by this content analysis approach should, whenever possible, be associated with some biologic characteristic of the individual in addition to psychological aspect or some social situation.

The content analysis technician applying this procedure to typescripts of tape-recorded speech has not had to worry about approaching the work of the content analysis following one theoretical orientation or another. Rather, the technician follows a strictly empirical approach, scoring the occurrence of any content or themes in each grammatical clause of speech according to a set of various, well-delineated language categories making up each of the separate verbal behavior scales. Two manuals (Gottschalk, Winget, Gleser, 1969; Gottschalk, 1982) and a book (Gottschalk, 1995) are available as well as journal articles (Gottschalk, 1975; Gottschalk and Hoigaard-Martin, 1986) which indicate what verbal categories should be looked for and how much the occurrence of each one is to be weighted. Following initial coding of content in this way, the content analysis technician, then, follows prescribed mathematical calculations leading up to a final score for the magnitude of any one psychological dimension or another.

Many individuals, mostly researchers, have achieved an acceptable level of proficiency coding the content and form analysis of verbal behavior, specifically, scoring content analysis scales based on the Gottschalk-Gleser content analysis method,. and they have published excellent work involving them. Some investigators or clinicians, however, have not wanted to take the time or acquire the expertise to use these content analysis scales reliably.

Digest of Known Uses

The Gottschalk-Gleser content analysis method provides a means of making many kinds of measurements in psychology and neuropsychiatry, including the measurement of psychological changes, making initial diagnostic formulations, providing suggestions for further evaluations (if necessary), and serving as guidelines for possible therapeutic interventions. It has been used in psychotherapy research to measure changes occurring in adults and children during the process of therapy, to predict psychotherapeutic outcome, to evaluate psychotherapeutic outcome, to assess the importance of defense mechanisms (such as displacement and denial) in different diagnostic groups of clients, and even to teach psychodynamic psychotherapy. It has been used to measure the relative severity of many mental and neuropsychiatric disorders, such as anxiety disorders, schizophrenia, depression, and dementia in aging and with alcohol abuse, and cognitive impairment associated with other drugs, such as, marijuana and the benzodiazepines It has been used in and recommended for psychosomatic research. It has been used to study the effects of partial and total body irradiation and sensory overload. It has proven to be very useful in neuropsychopharmacological studies, such as in the testing of new anti-anxiety drugs, the effects of major tranquilizers, antidepressants, analgesics, and in studying the relationship of the pharmacokinetics of psychoactive drugs and clinical response. It has been widely

used to assess the emotional status of medically ill patients, for example, in diabetes mellitus, with bruxism, with mastectomy for breast cancer and with cholecystectomy, and with attention-deficit-hyperactive children. More recently it has been used to assess the quality of life as well as the relationship of cerebral glucose metabolic rates (as assessed by positron emission tomography) and emotions occurring during dreams or silent wakeful mentation or while feeling hopeful or hopeless. Two other interesting applications of this content analysis method involved reviewing and demonstrating its cross-cultural validity and using it to assess the relative degree of cognitive impairment manifested by presidential candidates during their campaign debates.

Computerizing the Scoring Process

One of the first hurdles in developing an automatic system of speech content analysis has been that a person (instead of a machine) has had to label each word in a speech transcript with the appropriate syntactical tag indicating how the word is used in a sentence. Without the use of an automated parser, several early and interesting attempts have been made to apply computer techniques to content analysis. Philip Stone and his colleagues have pioneered a large group of these studies and have developed computer programs capable of classifying content (the General Inquirer System) and of ordering these content categories with one another in interesting ways. Benjamin Colby has also successfully used a computer to perform content analysis of primitive folk tales from Eskimo, Japanese, and Ixilmaya cultures.

In the field of psychiatry and psychoanalysis, the attempts to use computerized methods to analyze content have been limited mostly to the analysis of various classes of words that manifestly denote certain psychological categories, such as love, anxiety, hostility, intellectual processes, and so forth. Most of the automated content analysis projects have been based on single-word or single-phrase tag schemes. The shortcomings of these systems are mainly that they discard too much highly pertinent information. They fail to identify who did or felt what about whom. They throw away the meaningful classification of referents, such as "it," "that," "which," "those," "these," and so forth. They ignore the scoring of emotionally charged words that, out of context, cannot be properly classified, such as, "get" as in "I'll get you" or "bucket" as in "He kicked the bucket." They entirely miss the meaning of idiomatic or colloquial expressions, as in the latter examples.

The goal we set was to develop computer software that was able to understand grammar and syntax, that could parse natural language, and that could be taught to understand idioms and slang. Collaborating with two computer scientists, Gottschalk joined Hausmann and Brown, and using a PDP-10 computer, demonstrated that the Gottschalk-Gleser Hostility Outward scale could be successfully machine-scored from typescripts of speech (Gottschalk, Hausmann & Brown, 1975). They used a parser, namely Wood's Augmented Transition Network parser that was translated into UCI LISP, and they modified this software to run on a PDP-10. They changed its grammar to cover certain linguistic constructions that frequently occur in spoken discourse. In addition, a small dictionary of several hundred entries was created which could be maintained in the computer core. Since the Gottschalk-Gleser content analysis method derives a score on

the basis of the action verb in a clause in conjunction with noun-phrases that function as actors and recipients of this action, a technique was developed for assigning meaning to each of these constituents. Verbs were assigned semantic features called "verb-types" based on the thematic categories and their weights on the Gottschalk-Gleser Hostility Outward scale. In initial testing of this automated method on 100 sentences taken at random from the Manual of Instructions for Using the Gottschalk-Gleser Content Analysis Scale, 60% were correctly recognized, parsed, and scored. The typescripts of six five-minute speech samples were also scored for hostility outward by expert human content analysis technicians, and these scores correlated 0.80 (by a Spearman rank difference method) with the scores obtained by the computerized method. This result was considered equal to the lowest level criterion for acceptable human intercoder reliability in scoring the Gottschalk-Cleser Content Analysis scales. But the computer scoring missed many codable categories readily recognized by human scoring.

In 1982 Gottschalk and Bechtel reported research in which they developed a computerized method of scoring the Gottschalk-Gleser Anxiety scale. The computer software used was again written in UCI LISP, running on a mainframe-class computer. Whereas the average computer-derived anxiety score from 25 five minute speech samples was significantly lower than the average anxiety score obtained by human scoring, the intercorrelations between the two sets of anxiety scores was highly significant for total anxiety scores ($r=0.85$, $p<.0001$). The intercorrelations for the six anxiety subscale scores ranged from 0.58 (for shame anxiety) to 0.92 (for mutilation anxiety).

A more recent report by Gottschalk and Bechtel (1989), applying an improved PC-based program to the problem, demonstrated much improved results with respect to the computer's ability to recognize scorable clauses applicable to both the Gottschalk-Gleser Anxiety and three Hostility scales. Interscorer reliability between automated and human scoring was in the range of 0.80 and above for total scores and most subscale scores.

Further research by Gottschalk and Bechtel (1995) has resulted in the development of PCAD 2000, a commercial version of the content analysis scoring software. PCAD 2000 has demonstrated significant improvement in precision, speed of scoring, and the capacity to code serially long sequences of speech samples from computer files. Not only can the PCAD 2000 do a reliable job of scoring the Gottschalk-Gleser Anxiety and Hostility scales, but it also derives scores on the Social Alienation-Personal Disorganization, Cognitive Impairment, Depression, and Hope Scales. Using PCAD 2000, a user can obtain a printout of the scores for each clause, a count of the total number of words spoken in the verbal sample, raw and corrected scores for every scale and subscale, and comparisons of the scores with norms for children and adults, males and females..

Optionally, PCAD 2000 also provides an explanation of the significance and clinical implications of the derived scores, a summary of the strengths and limitations of this content analysis method, and possible clinical diagnostic classifications (derived from DSM-IV developed by the American Psychiatric Association) that the test user might consider.

Methods of Collecting Samples

Almost any method of collecting language samples can be used with PCAD 2000. The utility, validity, and reliability of a collection technique are beyond the control of the program. However, the user must be aware that, as with any other computer program, the quality of the output from PCAD 2000 is determined by the quality of the input, and care should be taken to ensure that verbal transcriptions are accurate and complete, that subject selection (where appropriate) satisfies the standards of good experimental design, and that any potential bias in the elicitation instructions is clearly recorded along with the verbal sample. In particular, users should be aware that PCAD 2000 results cannot be considered reliable on input samples shorter than about 85-90 words, and that the reliability and accuracy of the system improves with the length of the sample.

For research involving spoken language, the verbal behavior can be elicited in many different ways, depending on the research purposes and design of the study. The content of psychotherapeutic interviews can be analyzed: an individual can be asked to report their feelings and attitudes towards another person or person (Keating & Gottschalk, 1994), the speaker may be asked to relate their angry or anxious experiences or the speaker may be asked to report dreams.

"Standard Procedure"

One of the most useful ways of eliciting speech samples involves a procedure that enables the clinician or researcher to compare the content analysis scores obtained from the same individual at different times or across persons. This method also has available norms for children and adults, males and females. This approach elicits speech samples by using purposely ambiguous standardized instructions simulating a projective test situations as follows: "This is a study of speaking and conversation habits. I would like you to talk for five minutes about any personal interesting or dramatic life experiences you have ever had. If you finish telling about one life event, you can continue on telling about another one until the five minutes is over. While you are talking I would prefer not to reply to any questions you have until the five minutes is over. If you have any questions now, I will be happy to response to them now." The subject may possibly respond that he does not know what will be "interesting or dramatic" to the interviewer, and the interviewer can respond to this in a noncommittal fashion by saying he does not have to be concerned about what might be "interesting or dramatic" to the interviewer, but only what he finds "interesting or dramatic." Although speakers, on the average, produce around 500 words in five minutes, some speakers are unable to produce this quantity. As mentioned earlier, a verbal sample of 85-90 words has been demonstrated to be a reliable sample.

Users should note that since this neutral probe and five-minute sample protocol was used to elicit the samples that form the basis for the scoring norms, comparisons to the norms may not be valid for samples collected using a different collection protocol.

Transcriptions not Using Standard Procedure

Any form of English language verbal that can be transcribed can be scored by PCAD 2000. Caution should be taken in interpreting the results, especially in relying on comparisons to norms. However, research has been reported on material gathered from such diverse sources as psychotherapeutic interviews and presidential debates (Gottschalk, Uliana & Gilbert, 1988).

Written Text

PCAD 2000 can be applied equally readily to written as well as spoken verbalizations**.** In the seminal book on the Gottschalk-Gleser method of measuring psychological states and traits, mention was made of this broad applicability (Gottschalk and Gleser, 1969, pp. 256-257), although the method has been much more widely applied to typescripts of verbal communications than to archival, textual, or handwritten language. Some work has been done and reported in the literature, such as analysis of suicide notes (Gottschalk & Gleser 1960) and the writings of the Unabomber (Gottschalk & Gottschalk, 1999). Users need to design their collection protocols carefully, especially when using "found" materials not produced in response to a specific request. We anticipate that this method will be used more widely by historians, journalists, and social scientists since its introduction at an interdisciplinary workshop recently at Carnegie Mellon University, Pittsburgh, Pennsylvania, August 28-29, 1993 from which a book was published (Carl W. Roberts, Ed. *Text Analysis for the Social Sciences*, 1997).

Preparing Samples for Scoring

Historically, most samples to be scored using the Gottschalk-Gleser method have been written transcriptions of spoken verbal behavior, captured originally on audio recording tape. Over the years, a number of standard practices have developed to ensure that the transcription process is accurate and complete. With the introduction of computerized scoring techniques, additional requirements have been placed on the input format to avoid incorrect interpretation by the computer software. The suggestions and requirements provided in this section apply to the machine-readable text provided as input to PCAD 2000, regardless of whether that text originated as spoken or written. Careful review of this section, and thoughtful application of its guidance will result in fewer difficulties in use of PCAD 2000, and fewer anomalous results.

Machine-Readability

File Format

After recording a verbal sample, the first step in preparing the sample for scoring is to transcribe the sample -- that is, to write down what the subject said. Since this transcription must be in a form that can be read by the machine, it will usually be prepared in a word processor or a text editor. PCAD 2000 does not include a word processing facility or text editor, but most users will have one on their computer.

Many different word-processing and text-editing programs are available, such as WordPerfect and Microsoft Word. To support advanced features such as fonts, alternate printers, document formatting and the like, these programs typically insert "hidden" information into text files. This "hidden" information tells the word-processing program how to display text on the screen and how to print it when requested. Unfortunately, the "hidden" information can confuse the scoring program and cause it to assign incorrect scores or even (in extreme cases) cause it to cease functioning. To avoid the problem caused by hidden codes, sample files should be created in "ASCII" or "TEXT" form whenever possible. Most, if not all, word processing programs have this as an option. WordPerfect, for example, offers a Text In/Out feature. Microsoft Word has format options (such as "text only") under the Save As... command. In some cases, files without hidden commands may be created by "printing" the sample file into a disk file instead of to the printer.   Finally, some word processors come with conversion programs that are used outside the word processor to change the format of files.

In addition to plain ASCII text, the current version of this scoring program can also read formatted files created by WordPerfect version 5.0, 5.1, and 6.x.

Microsoft Windows offers some "built-in" editor capability in a utility called "Notepad." Files created using Notepad cannot be more than about 30,000 characters long, but this is rarely a problem for a single verbal sample. By default, Notebook stores its files in text format, which is appropriate for input to PCAD 2000.

Storing Samples

Samples may be stored on any medium that is readable by the computer where PCAD 2000 is running. Typically, this includes the primary hard disk and any floppy drives available on the computer. In some cases, the computer may offer higher-capacity removable media, like a Zip drive or a Syquest drive, or the computer may be on a network, in which case storage may be provided by one or more server computers. So long as the storage medium is available to be read through a standard Windows File Open dialog, samples may be stored there.

PCAD 2000 will place any machine-readable output in the same directory as the sample. Since scoring transcripts, for example, tend to be much larger than the sample that generates them, care should be taken when using low-capacity media such as diskettes as a source and destination.

GB Software strongly recommends that all PCAD 2000 users follow good computing practice by carefully backing up all critical data (such as input samples) on a regular basis to a location that can be stored separately from the subject computer.

Naming Samples

You may give any name you wish to your sample files (within the limits imposed by Windows). However, PCAD 2000 begins by assuming that sample file names end in ".SAM", and it will ordinarily only show files with that extension in the **File Open** dialog box. For this reason, GB Software strongly recommends that you select names that end in .SAM, such as "SAMPLE01.SAM", etc.

Transcription Issues

Listening to and Typing the Tape-Recorded Speech Sample

Since the typed audio transcript of the verbal sample is of primary significance in verbal behavior research, its accuracy is of extreme importance to the reliability and validity of the results. In the process of typing a recorded speech sample, for a number of reasons there may be words that cannot be heard clearly.

1. Remove the earphones and attempt to distinguish words by playing the sound directly to the room at large.
2. Vary the volume. Words sometimes become more easily distinguishable at a lower or higher volume.
3. Use a second person to listen.
4. When all else fails, do not guess. Try to determine how many words are being omitted. Indicate the approximate number of words omitted in parentheses at the appropriate point in the transcript.
5. Ask the person who took the verbal sample for assistance. Especially if the word or phrase is difficult to perceive because of the use of unusual names or words, or odd sentence construction, the person who obtained the verbal sample can frequently be helpful.

6. While in rough draft form, the verbal sample may be relistened to by an independent observer to check its accuracy. This step is especially crucial for those verbal samples where many nonverbal vocalizations have been used or where there has been difficulty with indistinct words..

The Coding Unit

The unit to be coded is the clause, whether independent or dependent. Subordinate or dependent clauses are ordinarily those related to the primary clauses by such words as "because," "since," "when," "which," "who," or "that." GB Software has found inaccurate clausing to be the primary cause of user problem reports. For this reason, the current version of PCAD2000 will determine clause boundaries automatically, without requiring special preparation by the user.

Dependent clauses may be scored whether they are classified as adverbial, adjectival, or noun clauses. It should be noted that a phrase serving to make for a multiple predicate or a multiple subject or object is not considered as a series of separate clauses. Where such phrases contain different scorable ideas, the rule usually followed is to assign the score that indicates the greatest intensity. Instances where the subject or the predicate is omitted but is understood are considered as scorable clauses. On those occasions where one must make a decision as the whether there is a missing but understood (elliptical) subject or predicate or whether a phrase is part of a multiple subject or predicate, differences of opinion can certainly arise. Often, these controversies cannot be simply resolved by consultation with grammarians or English professors, for grammatical rules themselves may permit several alternative solutions to such issues. In any event, unpublished studies performed by GB Software indicate that slight differences in determining clauses arising from such ambiguities make a relatively small contribution to error variance in the overall score.

PCAD 2000 treats normal sentence-ending punctuation (the period, question mark, and exclamation mark) as end-of-clause. It also treats the forward slash character ("/") as an end-of-clause marker. Although the current version of PCAD 2000 determines clause boundaries automatically, it is still possible to manually indicate boundaries. This is primarily offered to support backward compatibility with samples prepared for earlier versions of PCAD. To indicate clause boundaries that do not fall at the end of a sentence, insert a forward slash in the transcript. For example

```
I lived with my mother, father, and this brother / before
we moved sort of in the country / where we had a large
plot of land / that our house was on.
```

Because PCAD 2000 already recognizes sentence-ending punctuation, it is not necessary to add a forward slash at the end of a sentence.

Special Material within Samples

Sometimes, material within a sample needs to be treated specially. There are currently two such special situations: (a) material which should be ignored, and (b) material which provides "hints" to the scoring system.

(a) Material to ignore. The original sample collection protocol was built around uninterrupted verbal samples with a target length of about five minutes. Since those early days, the Scales have been used with a variety of collection techniques, including interviews, dialogs, and group discussions. Scoring the utterances of a single speaker from a literal transcription of such multiple-speaker activities can be difficult, because the non-relevant material must be deleted or otherwise ignored. To make these types of investigations easier, the computerized system permits portions of samples to be marked as "invisible." The material is then read and copied to any scoring log without being scored.

To have the system ignore material within a sample, enclose the material to be ignored within braces ({}). For example, `I don't know what to say.  {Tell me about some interesting experience you have had.}  Well, I went hang-gliding once.`

In this example, the first and third sentences would be scored, and the second would be ignored.

The capability to flag material as "invisible" to scoring also provides a means for investigators to place notes or comments into transcripts to draw attention to specific clauses or areas of the sample, or to record relevant non-verbal information that needs to be correlated with the verbal sample.

(b) Hints to the system. Some scoring categories are extremely difficult to automate. For example, determining that an utterance is "bizarre" or "nonsensical" (as required by the IIIA subscale of the Social Alienation/Personal Disorganization scale) is beyond the capabilities of the automated system. People, however, are generally good at making such determinations, even if they have not been formally trained as scorers. To exploit this role reversal, the system understands a limited set of annotations in samples and will translate those annotations directly into scores that it is unlikely to assign on its own.

All scoring "hints" are enclosed in square brackets ([]). Currently, scoring hints are used only on the Social Alienation-Personal Disorganization (SAPD) and Cognitive Impairment (CogImp) scales. The currently recognized hints and their assigned scores are:

Hint	SAPD Score	CogImp Score
[UNINTELLIGIBLE]	IIIA1	none
[MISSING]	IIIA1	none
[INCOMPLETE]	IIIA2	IIIA2
[BIZARRE]	IIIA3	none
[ILLOGICAL]	IIIA3	none

Case is not significant in hints. Additional text may appear within the square brackets, following the hint word. For example, [missing 4 words].

Other Details Involving Preparation of the Verbal Sample

- **Partial words and stutters**. Words such as "um" and "er" and "ah" are counted by the program, but then ignored for scoring.
- **Non-verbal sounds**. It is not necessary to type, for example, "(laughs)" or "(cries)" in samples to indicate non-verbal sounds. Such entries are not scorable and can bias the system. If you wish to include them, please set them off with braces {} as indicated in the preceding section.
- **Pauses**. It is not necessary to type "(pause)" or "(long pause)" to indicate gaps in verbal production. As with non-verbal sounds, please enclose them in braces if present.
- **Unclear words**. See the preceding section, Special Material within Samples, if the material is completely unintelligible.
- **Word count**. It is not necessary to count the number of words per verbal sample. The scoring program counts words and reports that count in the output record.
- **Ellipses**. As described earlier, PCAD 2000 identifies clause and sentence boundaries by looking for punctuation characters, including period (.), question mark (?), exclamation mark (!), and forward slash (/ -- for intra-sentence clause boundaries). Because these characters have special meaning, the use of ellipses (...) can confuse the program and should be avoided. Similarly, marking an end-of-sentence clause boundary with both a sentential punctuation mark (.?!) and a slash (as in "./" or "/?") should be avoided.
- **Abbreviations**. For the same punctuation-recognition reasons, occasional inaccuracies in recognizing abbreviations can occur. While these are usually minor, they can be avoided altogether by spelling out all abbreviated material.
- **The number 1**. For historical reasons, many typists are accustomed to using a lower case letter "l" to indicate the numeral "1", as, for example, in "l990". The scoring program distinguishes clearly between the two characters, and will not interpret a lower case "l" as the numeral "1". Since the scoring program converts all numerals to text word equivalents, the use of "l" in place of "1" should be avoided if possible.
- **Whitespace**. Whitespace is a term used to refer to blank characters, sequences of blanks, tabs, carriage returns, and page breaks, all of which affect the positioning of text on a page or screen, but which are not themselves visible. In general, the scoring program treats all whitespace identically. Thus, multiple spaces are the same as a single space. Indentation, page boundaries, and similar positioning which may be of assistance to the person preparing the sample are ignored by the program, and will not (usually) be reflected in the output report.
- **"Funny" characters**. Personal computers and word processing software are often capable of producing glyphs outside the normal range of text and punctuation (e.g. smiley faces, musical notes, line drawing characters). In general, the scoring program ignores such characters if they are present. However, unexpected and unusual combinations of such "funny" characters can cause problems, including unexpected program termination. Whenever possible, do not use characters outside the normal text, number, and punctuation range.
- **Spell checking**. Since the scoring program assumes correct spelling in the sample file, incorrect results may occur if words in the sample are misspelled. Most word

processing programs come with a spell-checking option, and we advise that you use it to minimize problems with unknown and misspelled words.

Providing Information about the Subject

In addition to the verbal sample transcripts themselves, the sample file may contain identifying data such as the name (or other identification) of the speaker, the date that the sample was obtained and by whom. The computer program looks at a certain character sequence in the file to determine sample boundaries and to distinguish between sample content and information which identifies the samples.

The special character sequence is ten or more equal signs in a row at the start of a line, for example, ==========. The program starts reading a sample file assuming that there is only scorable content in the file. It scores all of the input as a single sample until it encounters the end of the file or a line of equal signs as described above.

When the scoring program sees a line of equal signs, it stops scoring, assumes that the current sample (if any) is completed, and produces a summary report about that sample. It further assumes that the input is now identifying material which should be copied to the output record file, but which should not be scored. The program reads from the input, copying to the output, until it either encounters the end of the file or a second line of equal signs as described earlier.

In addition to simply copying the -inter-sample information to the output record file (if any), PCAD 2000 also watches for the occurrence of special keywords that indicate the presence of useful information about the subject who provided the next (upcoming) sample. This information is used to guide the selection of norms for score comparisons. Each keyword is immediately followed by the value of that attribute for the next subject. The currently defined keywords and their expected following values are:

Keyword	Value
Subject	Name of subject or study
Age	Subject age in years
Gender	Female or Male
Ethnicity	White, African-American, Native American, Hispanic, Asian
Education	Number as follows: 1 Some grade school 2 Finished grade school 3 Some high school 4 Finished high school 5 Some college 6 Finished college 7 Graduate/professional school

A second line of equal signs signals the program that the identifying information is complete and that scoring should resume. The program returns to its scoring state and scores until end of file or a line of equal signs are encountered. The process continues

alternating between scoring and copying identifying information until the end of the file is reached.

The lines of equal signs must be placed in the file by the sample file preparer. Remember that the sequences of equal signs must be at least ten characters long, and that they must start at the beginning of a line. In general, it is good practice to place a blank line before the line of equal signs to be sure that they are actually at the start of a line in case margin changes shift text locations in your word processor.

Multiple Samples in a Single File

Sample files may contain transcripts of more than one verbal sample. Using the method described in the preceding section to mark the end and beginning of a sample (lines of equal signs), a user may place several samples into a single file. These samples can be taken from the same subject or different subjects -- each is treated independently. This feature is offered only as a convenience, to enable a batch of samples to be scored in a single session.

To illustrate this concept, here is a (very brief) example of a multi-sample file. The file text runs down the left side of the page with comments (which are NOT part of the file) to the right.

```
======================================
Subject: Adolfo
Age: 25
Gender: Female
======================================
I don't know what to say.  I'm happy to help
with this study, but I don't know what to
talk about.  Thank you for the chance.
======================================
Subject: Adolfo
Age: 42
Gender: Male
======================================
I enjoy doing this. I'm a willing volunteer,
though I've run out of interesting things to
talk about.  I told you about my divorce and
suicide attempts, but that's all behind me now.
======================================
```

Flag "end of sample".
Non-scorable material
 describing following
 sample.
Switch back to new
 sample.
Sample 1 text.

Flag "end of sample".
Non-scorable
 descriptive
 material.
Start second sample.
Sample 2 text.

End sample 2.

There is a limit to the number of samples that PCAD 2000 will handle in a single file. This limit is determined by the total number of words in the file, and so will vary with the size of the samples. We currently recommend that multiple-sample files contain no more than ten separate samples, though we have successfully handled files with up to twenty-five separate samples. If an error is received because a multiple-sample file is too long, try removing samples to shorten it.

Major Errors

Recognizing Errors

Although GB Software has taken careful steps to reduce or completely eliminate errors, experience indicates that complex software like PCAD 2000 is likely to fail to perform in accordance with expectations from time to time. Wherever possible, we have tried to anticipate ways in which the system could do something unexpected, and have placed error warnings and recovery in those locations so that an overall user session will not be affected.

There remains a slight possibility of some sort of severe fault that our extensive analysis and testing has failed to uncover. So that you will know what to do in the unlikely event of such an error, we reproduce below (Figure 27) an example of a major error window.
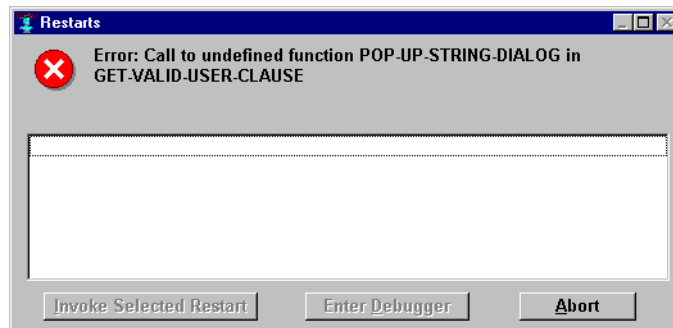
Figure 27: Example of a major PCAD 2000 error

Reporting Errors

Should you encounter such a window in your use of PCAD 2000, please

1. Write down the name of the file you were scoring, and (as best you can) where in the scoring process you had reached.
2. Write down the message at the top of the window, next to the large red-and-white X.
3. Click on the **Abort** button to clear the error. In most cases, this will cause PCAD 2000 to cease operation. If PCAD 2000 continues to be available, please select **Exit** from the **File** menu to leave PCAD 2000, since the internal state may be compromised. You should be able to restart PCAD 2000 and use it normally for other tasks, and perhaps even for the task you were doing when the problem arose.
4. Send the information about what happened to GB Software. If possible, include the file you were scoring on a diskette or as an email attachment, to allow us to attempt to recreate the error.

Initial Execution

Some users have reported difficulty in executing the system following installation. While we believe that the circumstances leading to this issue have been addressed, we are including the workaround here for completeness. The problem manifests itself as a dialog box that appears when PCAD 2000 is invoked. The dialog box lists several choices, then asks the user to choose an "image file". GBSOFT.IMG should be one of the choices. Double-click on the filename GBSOFT.IMG (or single click on the filename, then click left on the Select button in the dialog box). The PCAD 2000 main screen will appear after approximately 30-45 seconds, depending on your computer configuration. Before that time, you may think that the software has failed without telling you. Please be patient. If GBSOFT.IMG is not offered as a choice, or if there are other problems in getting PCAD 2000 to execute properly, please follow the procedures described above.

Publications Referenced in this Manual

American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition. Washington, D.C., American Psychiatric Association, 1994.

Bechtel, Robert. Developments in Computer Science with Application to Text Analysis. In Carl W. Roberts (Ed.). *Text Analysis for the Social Sciences*. Mahway, New Jersey, Lawrence Erlbaum Associates, 1997, pp.239-250.

Gottschalk, Louis A. (Ed.). *The Content Analysis of Verbal Behavior. Further Studies*. New York, Spectrum Publications, 1979.

Gottschalk, Louis A. *The Content Analysis of Verbal Behavior. New Findings and Clinical Applications*. Hillsdale, New Jersey, Lawrence Erlbaum Associates, 1995.

Gottschalk, Louis A. The Unobtrusive Measurement of Psychological States and Traits. In Carl W. Roberts (Ed.). *Text Analysis for the Social Sciences*. Mahway, New Jersey, Lawrence Erlbaum Associates, 1997, pp. 117-130.

Gottschalk, Louis A. and Bechtel, Robert. The measurement of anxiety through the computer analysis of verbal samples. *Comprehensive Psychiatry*. 23: 364-369, 1982.

Gottschalk, Louis A. and Bechtel, Robert. Artificial intelligence and the computerization of the content analysis of natural language. *Artificial Intelligence in Medicine*. 1: 131-137, 1989.

Gottschalk, Louis A. and Bechtel, Robert. Computerized measurement of the content analysis of natural language for use in biomedical research. *Computer Methods and Programs in Biomedicine*. 47: 123-130, 1995.

Gottschalk LA, Gleser GC: An analysis of the verbal content of suicide notes. *British Journal of Medical Psychology* 1960;33:195-204.

Gottschalk, Louis A. and Gleser, Goldine C. *The Measurement of Psychological States Through the Content Analysis of Verbal Behavior*. Los Angeles, Berkeley: University of California Press, 1969.

Gottschalk LA, Gottschalk L: Computerized content analysis of the Unabomber's writings. *American Journal of Forensic Psychiatry*. 20:5-31, 1999.

Gottschalk, Louis A., Hausmann, Catherine, Brown, John S. A computerized scoring system for use with content analysis scales. *Comprehensive Psychiatry*. 16: 77-90, 1975.

Gottschalk LA, Keating C: Influence of patient caregivers on course of patient illness. "Expressed emotion" and alternative measures. *Journal of Clinical Psychology. 43*: 898-912, 1994.

Gottschalk, Louis A. Lolas, Fernando, Viney, Linda L. *The Content Analysis of Verbal Behavior: Significance in Clinical Medicine and Psychiatry*. Heidelberg, Germany. Springer-Verlag, 1986.

Gottschalk LA, Uliana RL, Gilbert R: Presidential candidates and cognitive impairment measured from behavior in campaign debates. *Public Administration Review* 1988;48:613-619.

Gottschalk, Louis A., Winget Carolyn N., Gleser, Goldine C. *Manual of Instructions for Using the Gottschalk-Gleser Content Analysis Scales: Anxiety, Hostility, and Social Alienation-Personal Disorganization*. Los Angeles, Berkeley: University of California Press, 1969.

Appendix A: Scales Available in PCAD 2000

Definitions of the Gottschalk-Gleser content analysis scales available for computer scoring are given on the following pages. Scale definitions and weights for the Anxiety Scale, Hostility Scales, Social Alienation-Personal Disorganization Scale, Human Relations Scale, Dependency Strivings Scale, and Health/Sickness Scale are taken from *The Measurement of Psychological States Through the Content Analysis of Verbal Behavior*, by Louis A. Gottschalk and Goldine C. Gleser (University of California Press, 1969). The Hope Scale is taken from Louis A. Gottschalk, "A hope scale applicable to verbal samples," *Archives of General Psychiatry*, 30, 779-785, 1974. The Depression Scale is taken from Louis A. Gottschalk and Julia Hoigaard, "A depression scale applicable to verbal samples," *Psychiatry Research*, 17, 312-227, 1986. The Cognitive Impairment Scale is taken from Louis A. Gottschalk, "The development, validation, and applications of a measurement of cognitive impairment from the content analysis of verbal behavior." *Journal of Clinical Psychology*, 50, 349-361, 1994. The Achievement Strivings Scale given here is a modification of that given in Gottschalk & Gleser, 1969, as updated by Louis A. Gottschalk in his work at GB Software in 2000.

Anxiety Scale

1.   Death anxiety -- references to death, dying, threat of death, or anxiety about death experienced by or occurring to:

      a.   self (3).
      b.   animate others (2).
      c.   inanimate objects (1).
      d.   denial of death anxiety (1).

2.   Mutilation (castration) anxiety -- references to injury, tissue or physical damage, or anxiety about injury or threat of such experienced by or occurring to:

      a.   self (3).
      b.   animate others (2).
      c.   inanimate objects destroyed (1).
      d.   denial (1).

3.   Separation anxiety -- references to desertion, abandonment, ostracism, loss of support, falling, loss of love or love object, or threat of such experienced by or occurring to:

      a.   self (3).
      b.   animate others (2).
      c.   inanimate objects (1).
      d.   denial (1).

4.   Guilt anxiety -- references to adverse criticism, abuse, condemnation, moral disapproval, guilt, or threat of such experienced by:

      a.   self (3).
      b.   animate others (2).
      d.   denial (1).

5.   Shame anxiety -- references to ridicule, inadequacy, shame, embarrassment, humiliation, overexposure of deficiencies or private details, or threat of such experienced by:

      a.   self (3).
      b.   animate others (2).
      d.   denial (1).

6.   Diffuse or nonspecific anxiety -- references by word or phrase to anxiety and/or fear without distinguishing type or source of anxiety:

      a.   self (3).
      b.   animate others (2).
      d.   denial (1).

Hostility Directed Outward Scale: Destructive, Injurious, Critical Thoughts and Actions Directed to Others

(I) Hostility Outward -- Overt Thematic Categories	(II) Hostility Outward -- Covert Thematic Categories
a3 Self killing, fighting, injuring other individuals or threatening to do so.	a3 Others (human) killing, fighting, injuring other individuals or threatening to do so.
b3 Self robbing or abandoning other individuals, causing suffering or anguish to others, or threatening to do so.	b3 Others (human) robbing or abandoning, causing suffering or anguish to other individuals, or threatening to do so.
c3 Self adversely criticizing, depreciating, blaming, expressing anger, dislike of other human beings.	c3 Others adversely criticizing, depreciating, blaming, expressing anger, dislike of other human beings.
a2 Self killing, injuring or destroying domestic animals, pets, or threatening to do so.	a2 Others (human) killing, injuring or destroying domestic animals, pets, or threatening to do so.
b2 Self abandoning, robbing, domestic animals, pets, or threatening to do so.	b2 Others (human) abandoning, robbing, domestic animals, pets, or threatening to do so.
c2 Self criticizing or depreciating others in a vague or mild manner.	c2 Others (human) criticizing or depreciating other individuals in a vague or mild manner.
d2 Self depriving or disappointing other human beings.	d2 Others (human) depriving or disappointing other human beings.
	e2 Others (human or domestic animals) dying or killed violently in death-dealing situation or threatened with such.
	f2 Bodies (human or domestic animals) mutilated, depreciated, defiled.
a1 Self killing, injuring, destroying, robbing wildlife, flora, inanimate objects or threatening to do so.	a1 Wildlife, flora, inanimate objects, injured, broken, robbed, destroyed or threatened with such (with or without mention of agent).
b1 Self adversely criticizing, depreciating, blaming, expresing anger or dislike of subhuman, inanimate objects, places, situations.	b1 Others (human) adversely criticizing, depreciating, blaming, expressing anger or dislike of subhuman, inanimate objects, places, situations.
c1 Self using hostile words, cursing, mention of anger or rage without referent.	c1 Others angry, cursing without reference to cause or direction of anger; also instruments of destruction not used threateningly.
	d1 Others (human, domestic animals) injured, robbed, dead, abandoned or threatened with such from any source including subhuman and inanimate objects, situations (storms, floods, etc.).
	e1 Subhumans killing, fighting, injuring, robbing, destroying each other or threatening to do so.
	f1 Denial of anger, dislike, hatred, cruelty, and intent to harm.

57

Hostility Directed Inward Scale: Self-Destructive, Self-Critical Thoughts and Actions

I. Hostility Inward

Thematic Categories

a4   References to self (speaker) attempting or threatening to kill self, with or without conscious intent.

b4   References to self wanting to die, needing or deserving to die.

a3   References to self injuring, mutilating, disfiguring self or threats to do so, with or without conscious intent.

b3   Self blaming, expressing anger or hatred to self, considering self worthless or of no value, causing oneself grief or trouble, or threatening to do so.

c3   References to feelings of discouragement, giving up hope, despairing, feeling grieved or depressed, having no purpose in life.

a2   References to self needing or deserving punishment, paying for one's sins, needing to atone or do penance.

b2   Self adversely criticizing, depreciating self; references to regretting, being sorry or ashamed for what one says or does; references to self mistaken or in error.

c2   References to feelings of deprivation, disappointment, lonesomeness.

a1   References to feeling disappointed in self; unable to meet expectations of self or others.

b1   Denial of anger, dislike, hatred, blame, destructive impulses from self to self.

c1   References to feeling painfully driven or obliged to meet one's own expectations and standards.

Ambivalent Hostility Scale: Destructive, Injurious, Critical Thoughts and Actions of Others to Self

II. Ambivalent Hostility

Thematic Categories

a3   Others (human) killing or threatening to kill self.

b3   Others (human) physically injuring, mutilating, disfiguring self or threatening to do so.

c3   Others (human) adversely criticizing, blaming, expressing anger or dislike toward self or threatening to do so.

d3   Others (human) abandoning, robbing self, causing suffering, anguish, or threatening to do so.

a2   Others (human) depriving, disappointing, misunderstanding self or threatening to do so.

b2   Self threatened with death from subhuman or inanimate object, or death-dealing situation.

a1   Others (subhuman, inanimate, or situation) injuring, abandoning, robbing self, causing suffering, anguish.

b1   Denial of blame.

Content Analysis Scale of (Schizophrenic) Social Alienation and Personal Disorganization

Scores (Weights)	Categories and Scoring Symbols
	I. Interpersonal references (including fauna and flora).
	A. To thoughts, feelings or reported actions of avoidance, leaving, deserting, spurning, not understanding of others.
0	1. Self avoiding others.
+1	2. Others avoiding self.
	B. To unfriendly, hostile, destructive thoughts, feelings, or actions.
+1	1. Self unfriendly to others.
+$\frac{1}{3}$	2. Others unfriendly to self.
	C. To congenial and constructive thoughts, feelings, or actions.
-2	1. Others helping, being friendly toward others.
-2	2. Self helping, being friendly toward others.
-2	3. Others helping, being friendly towards self.
	D. To others (including fauna, flora, things and places).
0	1. Bad, dangerous, low value or worth, strange, ill, malfunctioning.
-1	2. Intact, satisfied, healthy, well.
	II. Intrapersonal references.
	A. To disorientation-orientation, past, present, or future. (Do not include all references to time, place, or person, but only those in which it is reasonably clear the subject is trying to orient himself or is expressing disorientation with respect to these. Also, do not score more than one item per clause under this category.)
+2	1. Indicating disorientation for time, place, or person or other distortion of reality.
0	2. Indicating orientation in time, place, person.
0	3. Indicating attempts to identify time, place, or person without clearly revealing orientation or disorientation.
	B. To self.
0	1a. Physical illness, malfunctioning (references to illness or symptoms due primarily to cellular or tissue damage).
+1	1b. Psychological malfunctioning (references to illness or symptoms due primarily to emotions or psychological reactions *not secondary* to cellular or tissue damage.
0	1c. Malfunctioning of indeterminate origin (references to illness or symptoms not definitely attributable either to emotions or cellular damage).
-2	2. Getting better.
-1	3a. Intact, satisfied, healthy, well; definite positive affect or valence indicated.
-1	3b. Intact, satisfied, healthy, well; flat, factual, or neutral attitudes expressed.
+$\frac{1}{2}$	4. Not being prepared or able to produce, perform, act, not knowing, not sure.
+$\frac{1}{2}$	5. To being controlled, feeling controlled, wanting control, asking for control or permission, being obliged or having to do, think, or experience something.
+3	C. Denial of feelings, attitudes, or mental state of the self.
	D. To food.
0	1. Bad, dangerous, unpleasant or otherwise negative; interferences or delays in eating; too much and wish to have less; too little and wish to have more.
0	2. Good or neutral.

Scores (Weights)	Categories and Scoring Symbols

	E.	To weather.
-1	1.	Bad, dangerous, unpleasant or otherwise negative (not sunny, not clear, uncomfortable, etc.).
-1	2.	Good, pleasant or neutral.
	F.	To sleep.
0	1.	Bad, dangerous, unpleasant or otherwise negative; too much, too little.
0	2.	Good, pleasant or neutral.

III. Miscellaneous.

A. Signs of disorganization.

+1	1.	Remarks or words that are not understandable or inaudible.
0	2.	Incomplete sentences, clauses, phrases; blocking.
+2	3.	Obviously erroneous or fallacious remarks or conclusions; illogical or bizarre statements.

B. Repetition of ideas in sequence.

| 0 | 1. | Words separated only by a word (excluding instances due to grammatical and syntactical convention, where words are repeated, e.g., "as far as," "by and by," and so forth. Also, excluding instances where such words as "I" and "the" are separated by a word). |
| +1 | 2. | Phrases, clauses (separated only by a phrase or clause). |

IV. References to the interviewer.

+1	A.	Questions directed to the interviewer.
+½	B.	Other references to the interviewer.
+1	V.	Religious and biblical references.

Cognitive and Intellectual Impairment Scale

Scores (Weights)	Categories and Scoring Symbols

<table>
<tr><td></td><td colspan="3">I.</td><td>Interpersonal References (including fauna and flora).</td></tr>
<tr><td></td><td></td><td>B.</td><td></td><td>To unfriendly, hostile, destructive thoughts, feelings, or actions.</td></tr>
<tr><td>-½</td><td></td><td></td><td>1.</td><td>Self unfriendly to others.</td></tr>
<tr><td></td><td></td><td>C.</td><td></td><td>To congenial and constructive thoughts, feelings, or actions.</td></tr>
<tr><td>-½</td><td></td><td></td><td>1.</td><td>Others helping, being friendly toward others.</td></tr>
<tr><td>-½</td><td></td><td></td><td>2.</td><td>Self helping, being friendly toward others.</td></tr>
<tr><td>-½</td><td></td><td></td><td>3.</td><td>Others helping, being friendly towards self.</td></tr>
<tr><td></td><td>II.</td><td></td><td></td><td>Intrapersonal references.</td></tr>
<tr><td>+3</td><td></td><td>A.</td><td></td><td>To disorientation-orientation, past, present, or future. (Do not include all references to time, place, or person, but only those in which it is reasonably clear the subject is trying to orient himself or is expressing disorientation with respect to these. Also, do not score more than one item per clause under this category.)</td></tr>
<tr><td></td><td></td><td>B.</td><td></td><td>To self.</td></tr>
<tr><td>-½</td><td></td><td></td><td>1.</td><td>Injured, ailing, deprived, malfunctioning, getting worse, bad, dangerous, low value or worth, strange.</td></tr>
<tr><td>+¼</td><td></td><td></td><td>3.</td><td>Intact, satisfied, healthy, well.</td></tr>
<tr><td>+1</td><td></td><td></td><td>5.</td><td>To being controlled, feeling controlled, wanting control, asking for control or permission, being obliged or having to do, think, or experience something.</td></tr>
<tr><td>+1</td><td></td><td>C.</td><td></td><td>Denial of feelings, attitudes, or mental state of the self.</td></tr>
<tr><td></td><td></td><td>D.</td><td></td><td>To food.</td></tr>
<tr><td>-1</td><td></td><td></td><td>2.</td><td>Good or neutral.</td></tr>
<tr><td></td><td>III.</td><td></td><td></td><td>Miscellaneous.</td></tr>
<tr><td></td><td></td><td>A.</td><td></td><td>Signs of disorganization.</td></tr>
<tr><td>+1</td><td></td><td></td><td>2.</td><td>Incomplete sentences, clauses, phrases; blocking.</td></tr>
<tr><td></td><td></td><td>B.</td><td></td><td>Repetition of ideas in sequence.</td></tr>
<tr><td>+1</td><td></td><td></td><td>2.</td><td>Phrases, clauses (separated only by a phrase or clause).</td></tr>
<tr><td></td><td>IV.</td><td></td><td></td><td>References to the interviewer.</td></tr>
<tr><td>+½</td><td></td><td>A.</td><td></td><td>Questions directed to the interviewer.</td></tr>
</table>

"Hope" Scale

Weights	Symbols	Content Categories
+1	H1	References to self or others getting or receiving help, advice, support, sustenance, confidence, esteem (a) from others; (b) from self.
+1	H2	References to feelings of optimism about the present or future (a) others; (b) self.
+1	H3	References to being or wanting to be or seeking to be the recipient of good fortune, good luck, God's favor or blessing (a) others; (b) self.
+1	H4	References to any kinds of hopes that lead to a constructive outcome, to survival, to longevity, to smooth-going interpersonal relationships (this category can be scored only if the word "hope" or "wish" or a close synonym is used).
-1	H5	References to not being or not wanting to be or not seeking to be the recipient of good fortune, good luck, God's favor or blessing.
-1	H6	References to self or others not getting or receiving help, advice, support, sustenance, confidence, esteem (a) from others; (b) from self.
-1	H7	References to feelings of hopelessness, losing hope, despair, lack of confidence, lack of ambition, lack of interest; feelings of pessimism, discouragement (a) others; (b) self.

Depression Scale

Weights			Content Categories and Scoring Symbols
	I.		Hopelessness.
1		1.	References to not being or not wanting to be or not seeking to be the recipient of good fortune, good luck, God's favor or blessing.
1		2.	References to self or others not getting or receiving help, advice, support, sustenance, confidence, esteem (a) from others; (b) from self.
1		3.	References to feelings of hopelessness, losing hope, despair, lack of confidence, lack of ambition, lack of interest; feelings of pessimism, discouragement (a) others; (b) self.
	II.		Self-accusation
		A.	Guilt depression. References to adverse criticism, abuse, condemnation, moral disapproval, guilt, or threat of such experienced by:
3			a. Self
2			b. Others
1			c. Denial
		B.	Shame depression. References to ridicule, inadequacy, shame, embarrassment, humiliation, overexposure of deficiencies or private details, or threat of such experienced by:
3			a. Self
2			b. Others
1			c. Denial
		C.	Hostility directed inward
4			1a. References to self attempting or threatening to kill self, with or without conscious intent.
4			1b. References to self wanting to die, needing or deserving to die.
3			2a. References to injuring, mutilating, disfiguring self or threats to do so, with or without conscious intent.
3			2b. Self-blaming, expressing anger or hatred to self, considering self worthless or of no value, causing oneself grief or trouble, or threatening to do so.
2			3a. References to self needing or deserving punishment, paying for one's sins, needing to atone or do penance.
2			3b. Adversely criticizing, depreciating self; references to regretting, being sorry or ashamed for what one says or does; references to self mistaken or in error.
2			3c. References to feelings of deprivation, disappointment, lonesomeness.
1			4a. References to feeling disappointed in self; unable to meet expectations of self or others.
1			4b. Denial of anger, dislike, hatred, blame, destructive impulses from self to self.
1			4c. References to feeling painfully driven or obliged to meet one's own expectations and standards.
1	III.		Psychomotor retardation. References to general retardation and slowing down in thinking, feeling, or action.

Weights			Content Categories and Scoring Symbols

IV. Somatic concerns.

1   A.   Hypochondriacal component. References to bodily malfunctioning or physical problems in total body or any parts or systems.

1   B.   Sleep disturbances. References to any disturbances in sleeping.

1   C.   Sexual disturbances. References to sexual malfunctioning of any kind, including menstrual disturbances or complaints.

1   D.   Gastrointestinal disturbances. References to appetite disturbances, changes in bowel habits, abdominal discomforts.

1   E.   General somatic symptoms, including heaviness in limbs, back, or head, backaches, headaches, muscle aches, loss of energy, fatigibility, and loss of weight.

V. Death and mutilation depression.

    A.   Death depression. References to death, dying, threat of death, or anxiety about death experienced by or occurring to:

3   a.   Self.

2   b.   Animate others.

1   c.   Inanimate objects.

1   d.   Denial of death anxiety.

    B.   Mutilation depression. References to injury, tissue or physical damage, or anxiety about injury or threat of such experienced by or occurring to:

3   a.   Self.

2   b.   Animate others.

1   c.   Inanimate objects destroyed.

1   d.   Denial.

VI. Separation depression. References to desertion, abandonment, ostracism, loss of support, falling, loss of love or love object, or threat of such experienced by or occurring to:

3   a.   Self.

2   b.   Animate others.

1   c.   Inanimate objects.

1   d.   Denial.

VII. Hostility outward.

    A.   Hostility outward -- overt.

3   1a.   Self killing, fighting, injuring other individuals or threatening to do so.

3   1b.   Self robbing or abandoning other individuals, causing suffering or anguish to others, or threatening to do so.

3   1c.   Self adversely criticizing, depreciating, blaming, expressing anger, dislike of other human beings.

2   2a.   Self killing, injuring or destroying domestic animals, pets, or threatening to do so.

2   2b.   Self abandoning, robbing, domestic animals, pets, or threatening to do so.

2   2c.   Self criticizing or depreciating others in a vague or mild manner.

2   2d.   Self depriving or disappointing other human beings.

1   3a.   Self killing, injuring, destroying, robbing wildlife, flora, inanimate objects or threatening to do so.

1   3b.   Self adversely criticizing, depreciating, blaming, expressing anger or dislike of subhuman, inanimate objects, places, situations.

1   3c.   Self using hostile words, cursing, mention of anger or rage without referent.

Weights		Content Categories and Scoring Symbols
	B.	Hostility outward -- covert.
3	1a.	Others (human) killing, fighting, injuring other individuals or threatening to do so.
3	1b.	Others (human) robbing or abandoning, causing suffering or anguish to other individuals, or threatening to do so.
3	1c.	Others adversely criticizing, depreciating, blaming, expressing anger, dislike of other human beings.
2	2a.	Others (human) killing, injuring or destroying domestic animals, pets, or threatening to do so.
2	2b.	Others (human) abandoning, robbing, domestic animals, pets, or threatening to do so.
2	2c.	Others (human) criticizing or depreciating other individuals in a vague or mild manner.
2	2d.	Others (human) depriving or disappointing other human beings.
2	2e.	Others (human or domestic animals) dying or killed violently in death-dealing situation or threatened with such.
2	2f.	Bodies (human or domestic animals) mutilated, depreciated, defiled.
1	3a.	Wildlife, flora, inanimate objects, injured, broken, robbed, destroyed or threatened with such (with or without mention of agent).
1	3b.	Others (human) adversely criticizing, depreciating, blaming, expresing anger or dislike of subhuman, inanimate objects, places, situations.
1	3c.	Others angry, cursing without reference to cause or direction of anger; also instruments of destruction not used threateningly.
1	3d.	Others (human, domestic animals) injured, robbed, dead, abandoned or threatened with such from any source including subhuman and inanimate objects, situations (storms, floods, etc.).
1	3e.	Subhumans killing, fighting, injuring, robbing, destroying each other or threatening to do so.
1	3f.	Denial of anger, dislike, hatred, cruelty, and intent to harm.

Human Relations Scale

Weights	Content Categories and Scoring Symbols

A1. References to giving to, supporting, helping, or protecting others.

+2   a. Self to others -- specific.

+1   a'. Self to others -- references in which the giving etc. is inferential or the object is unspecified.

+1   b. Others giving to others or others receiving from and being taken care of by others.

A2. References to warm, loving, congenial human relations or human relations in which a desire to be closer is expressed. The reference should be specific rather than inferred.

+2   a. Involving self or self and others.

+1   b. Involving others.

A3. Concern for other people; references to missing others when they are away. References should be to specific others only.

+1   a. Self about others.

+1   b. Others about self.

+½   c. Others about others.

A4. Praise or approval of others, indicating more than neutral relations but not conveying as much positive feeling or warmth as A2, above.

+1   a. Self to others.

+1   b. Others to self.

+½   c. Others to others.

B1. References to manipulative relationships with other human beings. The reference should involve demanding someone do something largely in the service of one's own needs (exploitive) or deliberately making someone feel shame or guilt, e.g., by putting emphasis on how one is made to suffer.

-½   a. Self manipulating others.

-1   b. Others manipulating self.

-½   c. Others manipulating others.

B2. Neutral: nonevaluative references to any kinds of human relations which specify the person(s) interacted with, but which do not specify the nature of the deeper involvement and which are not classified elsewhere. All references to sellf and others (e.g., we drove, we reached, we thought, etc.) not scorable elsewhere are coded B2a.

+¼   a. Self or self and others.

+¼   b. Others.

-½ B3. Neutral: nonevaluative references to any kinds of human relations, which are generalized, ambiguous as to person(s) interacted with and impersonal.

C1. Explusive: references to competitive, hostile, depreciating, and smearing attitudes, impulses, actions.

-½   a. Self to others.

-1   b. Others to self.

-½   c. Others to others.

C2. Retentive: references to withholding affection, interest, approval or attention from people; references to disapproval.

-1   a. Self from others.

-1   b. Others from self.

-½   c. Others from others.

C3. Distancing: reference in which people are alienated, drawn apart, kept at a distance from one another.

-1   a. Focus on self.

-½   b. Focus on others.

Weights	Content Categories and Scoring Symbols
	D1. Optimism: references to self receiving from, getting from, being taken care of by other people in gratifying and positive ways; interest in other people based on what they can do for oneself; asking others for help; emphasis on the self as the recipient of nurturance and sustenance.
+2	a. Self receiving from others.
	D2. Pessimism: references to frustration in being taken care of or to poor or inadequate protection, support, or care.
-½	a. Self.
-½	b. Others.
	D3. Separation: any reference to separation, loss, death, not scored elsewhere.
-1	a. Self.
-½	b. Others.
	D4. References to eating or to food in connection with others.
+½	(1) Positive valence.
	a. Self.
	b. Others.
+½	(2) Neutral valence.
	a. Self.
	b. Others.
	(3) Negative valence.
-1	a. Self.
-½	b. Others.
0	D5. References to difficulty talking, to not knowing what to say, to being at a loss for words with interviewer or others.
	D6. Direct interaction with interviewer.
+½	a. Asking questions of interviewer when standardized verbal sample instructions have been used.
+½	b. Other direct references: "you know," or statements addressing interviewer directly by name or as "you."
-2	E1. References to lack of humans or subhumans in the environment. The references must contain evidence of lack of interest in or need for human or subhuman objects.
-1	E2. References to eating, food, drinking, meals, etc. out of the context of other people. Code both self and others.
-1	E3. References to bathing alone (no other people in view) or to undifferentiated or amorphous substances or surroundings involving no discernible human beings.

Achievement Strivings Scale

Weights   Content Categories and Scoring Symbols

+1   I. Achievement
                        A. Vocational. Reference to work, occupation, job, including naming and
                        identification.
                                    a. Self or self and others.
                                    b. Others.
                        B. Avocational. Reference to hobby, leisure activity, recreation, including naming
                        and identification.
                                    a. Self or self and others.
                                    b. Others.
-1   II. Deterrents to Achievement
                        A. External dangers or problems or fear of loss of control or limit setting on part of
                        others. References to lack control by others; references to errors or misjudgments by
                        others that might injure the self.
                                    a. Self or self and others.
                                    b. Others.
                        B. Internal obstacles: references to difficulties in setting limits on oneself or problems
                        in disciplining the self; references to error or misjudgments by self that might harm
                        the self.
                                    a. Self or self and others.
                                    b. Others.
                        C. Other deterrents -- which cannot be distinguished as to cause.
                                    a. Self or self and others.
                                    b. Others.

Dependency Strivings and Frustrated Dependency Scales

Scale of Dependency Strivings

Types of Reference about Dependency Strivings

A. Statements referring to having, getting, wanting or needing help, support, protection, care, approval, love, doctoring, and divine assistance.
B. References to oral activities, food, etc. Includes any oral activity, such as chewing gum, eating, smoking, drinking, swallowing, sucking, and biting.
C. Denial of dependency strivings.

Person Involved in Dependency Strivings

1. Self or self and others
2. Others or unspecified.

Time of Occurrence of Strivings

a. Past.
b. Present.
c. Future or unspecified.

Scale of Frustrated Dependency Strivings

Types of Reference about Frustrated Dependency Strivings

A. References to self being frstrated in having, getting, wanting, or needing help, support, protection, care, approval, love, doctoring, and divine assistance.
B. References to oral frustration. Includes any oral-gastric frustrations, e.g., difficulties or delays in getting food, water, or other objects to relieve oral tension. Need to resort to scraps or waste products for food, hunger, thirst, food deprivation, dry throat, difficulty in obtaining food, empty stomach, being out of cigarettes, difficulty in swallowing, etc.
C. Denial of oral frustration.
D. Reference to others being frustrated in wanting help, support, protection from speaker.

Person Involved in Frustrated Dependency Strivings

1. Self or self and others
2. Others or unspecified.

Time of Occurrence of Frustrated Dependency Strivings

a. Past.
b. Present.
c. Future or unspecified.

Health/Sickness Scale

Coding Symbol	Category	Weight
HS1a	References to feelings of well-being, health, being symptom-free (mental or physical) as experienced by others.	+1
HS1b	References to feelings of well-being, health, being symptom-free (mental or physical) as experienced by self.	+1
HS2a	References to feelings of poor health, having symptoms, pain, suffering (mental or physical) as experienced by others.	+1
HS2b	References to feelings of poor health, having symptoms, pain, suffering (mental or physical) as experienced by self.	+1

Quality of Life Scale

The Quality of Life score is computed on a total sample basis -- no score is assigned to individual clauses. Quality of Life is determined by combining scores on other scales as indicated in the formula below:

Quality of Life = (Human Relations + Positive Hope) -
(Social Alienation/Personal Disorganization + Depression + Health/Sickness)

Notice that both the Human Relations and Social Alienation/Personal Disorganization scales can have scores that are either positive or negative. Thus, a negative Human Relations score will reduce the overall Quality of Life score, while a negative Social Alienation/Personal Disorganization score will increase the Quality of Life score. This should match intuition.

Appendix B: Bibliography

Aronsohn S, Lolas F, Manns A, Miralles R: Affective content of speech and treatment of outcome in bruxism. In *Content Analysis of Verbal Behavior. Significance in Clinical Medicine and Psychiatry*. Edited by Gottschalk LA, Lolas F, Viney LL. Heidelberg, Springer-Verlag, 1979, pp. 149-156.

Atkinson RM: Measurement of subjective effects of nitrous oxide: Validation of post-drug questionnaire responses by verbal content analysis of speech samples collection during drug intoxication. In *Content Analysis of Verbal Behavior. Further Studies*. Edited by Gottschalk LA. New York, Spectrum Publications, 1979, pp. 335-347.

Bennett MDJ: *The emotional response of husbands to suicide attempts by their wives*. Doctoral thesis, Sydney, Australia, University of Sydney, 1972.

Cohn JB, Gottschalk LA: Double-blind comparison of ketazolam and placebo using once-a-day dosing. *Journal of Clinical Pharmacology* 1980;20:676-680.

Elliott HW, Gottschalk LA, Uliana RL: Relationships of plasma meperidine levels to changes in anxiety and hostility. *Comprehensive Psychiatry* 1974;15:249-254.

Gift TE, Cole RE, Wynne LC: A hostility measure for use in family contexts. *Psychiatry Research* 1985;15:205-210.

Gleser GC, Gottschalk LA, and Springer KJ: An anxiety scale applicable to verbal samples. *Archives of General Psychiatry* 1961;5:593-605.

Gleser GC, Gottschalk LA, Fox R, Lippert W: Immediate changes in affect with chlordiazepoxide in juvenile delinquent boys. *Archives of General Psychiatry* 1965;13:291-295.

Gleser GC, Lubin A: Response productivity in verbal content analysis: A critique of the Marsden, Kalter and Ericson paper. *Journal of Cosulting and Clinical Psychology* 1976;44:508-510.

Gleser GC, Winget CN, Seligman R: Content scaling of affect in adolescent speech samples. *Journal of Youth and Adolescence*. 1979;8:282-297.

Gleser, GC, Winget C, Seligman R, Rauh JL: Evaluation of psychotherapy with adolescents using content analysis of verbal samples. In *The Content Analysis of Verbal. Further Studies*. Edited by Gottschalk, LA. Ch. 8. New York, Spectrum Publications, 1979, pp. 213-233.

Gottschalk LA: An objective method of measuring psychological states associated with changes in neural function. *Journal of Biological Psychiatry* 1972;4:33-49.

Gottschalk LA: A hope scale applicable to verbal samples. *Archives of General Psychiatry*. 1974; 7:489-496.

Gottschalk LA: The application of a method of content analysis to psychotherapy research. *American Journal of Psychotherapy*. 1974; 28:488-499.

Gottschalk LA: The psychoanalytic study of hand-mouth approximations, In *Psychoanalysis and Contemporary Science*. Edited by Goldberger L and Rosen VH. Vol 3. New York, International Universities Press, 1974, pp. 261-295.

Gottschalk LA: Drug effects in the assessment of affective states in man. In *Current Developments in Psychopharmacology*. Edited by WB Essman and L Valzelli. Vol 1. Spectrum Publications, New York, 1975.

Gottschalk LA: Children's speech as a source of data towards the measurement of psychological states. *Journal of Youth and Adolescence* 1976; 5:11-36.

Gottschalk LA: Differences in the content of speech of girls and boys ages six to sixteen. In *Studies on Childhood Psychiatry and Psychological Problems*. D.V. Siva-Sankar (ed.) Westbury, Conn., PJD Publications, 1976, pp. 351-379.

Gottschalk LA: Effects of certain benzodiazepine derivatives on disorganization of thought as

manifested in speech. *Current Therapeutic Research* 1977;21:192-206.

Gottschalk LA: Manual of uses and applications of the Gottschalk-Gleser verbal behavior scales. *Research Communications in Psychology, Psychiatry and Behavior* 1982;7:273-327.

Gottschalk LA: Research using the Gottschalk-Gleser Content Analysis Scales in English since 1969. In *Content Analysis of Verbal Behavior. Significance in Clinical Medicine and Psychiatry*. Edited by LA Gottschalk LA, F Lolas, LL Viney. Heidelberg, Springer-Verlag, l986, pp. 29-46.

Gottschalk LA: Content category analysis -- The measurement of the magnitude of psychological dimensions in psychotherapy. In *Language in Psychotherapy: Strategies of Discovery*. Edited by RL Russell, Irvington Publishers, Inc., New York, 1987.

Gottschalk LA: Narcissism: Its normal evolution, and development and the treatment of its disorders. *American Journal of Psychotherapy* 1988;42:4-27.

Gottschalk LA: *Content Analysis of Verbal Behavior. New Findings and Clinical Applications*. Hillsdale, NJ, Lawrence Elbaum Associates, 1995.

Gottschalk, LA. The application of a computerized measurement of the content analysis of natural language to the assessment of the effects of psychoactive drugs. *Methods and Findings in Experimental and Clinical Pharmacology*. 21:133-138, 1999.

Gottschalk LA. The application of computerized content analysis of natural language to psychotherapy now and in the future. *American Journal of Psychotherapy*. 54:305-311, 2000.

Gottschalk LA, Aronow WS, Prakash R: Effect of marihuana and placebo-marihuana smoking on psychological state and on psychophysiological cardiovascular function in anginal patients. *Biological Psychiatry* 1977;12:255-266.

Gottschalk LA, Bates DE, Waskow IE, Katz MM, and Olson J: Effect of amphetamine or chlorpromazine on achievement strivings scores derived from the content analysis of speech. *Comprehensive Psychiatry* 1972;12:430-435.

Gottschalk LA, Bechtel RJ: The measurement of anxiety through the computer analysis of verbal samples. *Comprehensive Psychiatry*. 23: 364-369, 1982.

Gottschalk LA, Bechtel, RJ: Artificial intelligence and the computerization of the content analysis of natural language. *Artificial Intelligence in Medicine* 1: 131-137, 1989.

Gottschalk LA, Bechtel, RJ: Computerized measurement of the content analysis of language. *Computer Methods and Programs in Biomedicine*. 47: 123-130, 1995.

Gottschalk LA, Bechtel RJ, Buchman TG. A computerized measure of quality of life derived from the content analysis of natural language. *BMC Psychiatry* (Submitted) 2002.

Gottschalk LA, Bechtel RJ, Buchman TG. Computerized content analysis of conversational interactions. *Psychological Assessment* (Submitted) 2002.

Gottschalk LA, Bechtel RJ, Maguire GA, Harrington DE, Levinson DM, Franklin DL, Carcamo D. Computerized measurement of cognitive impairment and associated neuropsychiatric dimensions. *Comprehensive Psychiatry*. 41:326-333, 2000.

Gottschalk LA, Bechtel RJ, Maguire GA, Katz ML, Levinson DM, Harrington DE, Nakamura K, Franklin DL. Computer detection of cognitive impairment and associated neuropsychiatric dimensions from the content analysis of verbal samples. SBIR Phase I and Phase II Final Report. Contract #N44DA-9-6502. Covering September 1, 1999 through February 28, 2002. February 28, 2002. Pages 25.

Gottschalk LA, Bechtel RJ, Maguire GA, Katz ML, Levinson DM, Harrington DE, Nakamura K, Franklin DL. Computer detection of cognitive impairment and associated neuropsychiatric dimensions from the content analysis of verbal samples. *American Journal of Drug and Alcohol Abuse*. (In press) 2002.

Gottschalk LA, Biener R, Noble EP, Birch H, Wilbert DE, and Heiser JF: Thioridazine plasma levels and clinical response. *Comprehensive Psychiatry* 1975; *16*: 323-337.

Gottschalk LA, Buchsbaum MS, Gillin JC, Wu J, Reynolds C, Herrera DB: Anxiety levels in dreams: Relation to localized cerebral glucose metabolic rate. *Brain Research* 1991; 538:107-110.

Gottschalk LA, Buchsbaum MS, Gillin JC, Wu J, Reynolds C, Herrera DB: Positron emission tomographic studies of the relationship of cerebral glucose metabolism and the magnitude of anxiety and hostility experienced during dreaming and waking. *Journal of Neuropsychiatry and Clinical Neuroscience* 1991; 3:131-142.

Gottschalk LA, Buchsbaum MS, Gillin JC, Wu J, Reynolds C, Herrera DB: The effect of anxiety and hostility in silent mentation on cerebral glucose metabolic rate. *Comprehensive Psychiatry* 1992; 33:52-59.

Gottschalk LA, Cleghorn JM, Gleser GC, Iacono JM: Studies of relationships of emotions to plasma lipids. *Psychosomatic Medicine* 1965; 27:102-111.

Gottschalk LA, Cohn J: Studies of cognitive functions as influenced by administration of haliperidol or diazepam in detoxification of acute alcoholics. *Psychopharmacology Bulletin* 1980;16:55-56.

Gottschalk LA, Covi L, Uliana R, Bates DE: Effects of diphenylhydantoin on anxiety and hostility in institutionalized prisoners. *Comprehensive Psychiatry* 1973;14:503-511.

Gottschalk LA, DeFrancisco D, Bechtel RJ. Computerized content analysis of some adolescent writings of Napoleon Bonaparte. A test of the validity of the method. *Journal of Nervous and Mental Disease*. (In press) 2002.

Gottschalk LA, Dinovo E, Biener R, Birch H, Syben M, Noble EP: Plasma levels of mesoridazine and its metabolites and clinical response in acute schizophrenia after a single intramuscular drug dose. *Psychopharmacology Bulletin*. 1975; 11:33-34.

Gottschalk LA, Eckardt MJ, Pautler CP, Wolf RJ, Terman SA: Cognitive impairment scales derived from verbal samples. *Comprehensive Psychiatry* 1983;24:6-19.

Gottschalk LA, Eckardt MJ, Cohn JB, Terman SA, Wolf RJ: A cognitive impairment scale applicable to verbal samples and its possible use in clinical trials in patients with dementia. *Psychopharmacology Bulletin* 1980;16;25-27.

Gottschalk LA, Eckardt MJ, Feldman DJ: Further validation studies of a cognitive-intellectual impairment scale applicable to verbal samples. In *The Content Analysis of Verbal Behavior: Further Studies*. Edited by LA Gottschalk. Spectrum Publications, New York, 1979, pp. 9-40.

Gottschalk LA, Eckardt MJ, Hoigaard-Martin JC, Gilbert RL, Wolf RJ, Johnson W: Neuropsychological deficit in chronic alcoholism: Early detection and prediction by analysis of verbal samples. *Substance and Alcohol Action/Misuse* 1983; 4:45-58.

Gottschalk LA, Eckardt MJ, Pautler CP, Wolf RJ, Terman SA: Cognitive impairment scales derived from verbal samples. *Comprehensive Psychiatry* 1983;24:6-19.

Gottschalk LA, Elliott HW: Effects of triazolam and flurazepam on emotions and intellectual function. *Research Communications in Psychology, Psychiatry and Behavior* 1976;1:575-595.

Gottschalk LA, Elliott HW, Bates DE, and Cable C: Content analysis of speech samples to determine effect of lorazepam on anxiety. *Clinical Pharmacology and Therapeutics* 1972;13:323-328.

Gottschalk LA, Fox RA, and Bates DE: A study of prediction and outcome in a Mental Health Crisis Clinic. *American Journal of Psychiatry* 1973;130:1107-1111.

Gottschalk LA, Frank EC: Estimating the magnitude of anxiety from speech. *Behavioral Science*. 1967;12:289-295.

Gottschalk LA, Fronczek J, Abel L: Emotions, defenses, coping mechanisms, and symptoms. *Psychoanalytic Psychology.* 10:237-260, 1992.

Gottschalk LA, Fronczek J: Defense mechanisms and hope as protective factors in physical and mental disorders. In *The Concept of Defense Mechanisms in Contemporary Psychology*. Edited

73

by U Hentschel, G Smith, W Ehlers, JG Draguns. New York, Springer-Verlag, 1993, pp 339-359.

Gottschalk LA, Fronczek J, Abel L, Buchsbaum MS: The cerebral neurobiology of hope and hopelessness. *Psychiatry*. 56:270-281, 1992.

Gottschalk LA, Fronczek J, Abel, L, Buchsbaum MS, Fallon JH: The neurobiology of anxiety, anxiety-displacement, and anxiety-denial. *Psychotherapy and Psychosomatics*. 70:17-24, 2001

Gottschalk LA, Fronczek J, Abel L, Buchsbaum MS: The relationship of social alienation and thought disorder in normal male subjects to localized cerebral glucose metabolic rate as measured by positron emission tomography. *Comprehensive Psychiatry*. 33:332-341, 1992.

Gottschalk LA, Gleser GC: An analysis of the verbal content of suicide notes. *British Journal of Medical Psychology* 1960;33:195-204.

Gottschalk LA, Gleser GC: Distinguishing characteristics of the verbal communications of schizophrenic patients. In *Disorders of Communication*. A.R.N.M.D. 1964;42:400-413.

Gottschalk LA, Gleser GC: *The Measurement of Psychological States through the Content Analysis of Verbal Behavior*. Los Angeles, Berkeley, University of California Press, 1969.

Gottschalk LA, Gleser GC, Cleghorn JM, Stone WN, Winget CN: Prediction of changes in severity of the schizophrenic syndrome with discontinuation and administration of phenothiazines in chronic schizophrenic patients: language as a predictor and measure of change in schizophrenia. *Comprehensive Psychiatry* 1970;11:123-140.

Gottschalk LA, Gleser GC, Daniels RS, Block SL: The speech patterns of schizophrenic patients: A method of assessing relative degree of personal disorganization and social alienation. *Journal of Nervous and Mental Disease.* 1958;127:153-166.

Gottschalk LA, Gleser GC, D'Zmura TL, Hanenson IB: Some psychophysiological relationships in hypertensive women. The effect of Hydrochlorothiazide on the relations of affect to blood pressure. *Psychosomatic Medicine* 1964;26:610-617.

Gottschalk LA, Gleser GC, Hambidge G Jr: Verbal analysis. Some content and form variables in speech relevant to personality adjustment. Archives *of Neurology and Psychiatry* 1957;77:300-311.

Gottschalk LA, Gleser GC, Magliocco EB, D'Zmura TL: Further studies on the speech patterns of schizophrenic patients. Measuring inter-individual differences in relative degree of personal disorganization and social alienation. *Journal of Nervous and Mental Disease* 1961;132: 101-113.

Gottschalk LA, Gleser GC, Springer KJ: Three hostility scales applicable to verbal samples. *Archives of General Psychiatry* 1963;9:254-279.

Gottschalk LA, Gleser GC, Springer KJ, Kaplan SM, Shanon J, Ross WD: Effects of perphenazine on verbal behavior patterns. *Archives of General Psychiatry* 1960;2:632-639.

Gottschalk LA, Gleser, GC, Stone WN, Kunkel RL: Studies of psychoactive drug effects on non-psychiatric patients. Measurement of affective and cognitive changes by content analysis of speech. Ch. 5. In *Psychopharmacology of the Normal Human*. Edited by Evans, W and Kline, N Springfield, Illinois, Charles C Thomas, 1968, pp. 62-168.

Gottschalk LA, Gleser GC, Wylie HW Jr, Kaplan SM: Effects of imipramine on anxiety and hostility levels. *Psychopharmacologia* 1965;7:303-310.

Gottschalk LA, Gottschalk LH. Computerized content analysis of the Unabomber's writings. *American Journal of Forensic Psychiatry*. 20:5-31, 1999.

Gottschalk LA, Haer JL, Bates DE: Effect of sensory overload on psychological state. *Archives of General Psychiatry* 1972;27:451-457.

Gottschalk LA, Haer JL, Bates DE, Effect of sensory overload on psychological state. *Mental Health Digest* 1973;5:29-31.

Gottschalk LA, Hambidge G Jr: Verbal behavior analysis: A systematic approach to the problem of

quantifying psychologic processes. *Journal of Projective Techniques* 1955;19:387-409.

Gottschalk LA, Hambidge G Jr: Effect of interviewer on anxiety and hostility of interviewee. (Reported in Gottschalk and Gleser, 1969, pp. 260-261). Unpublished study, 1956.

Gottschalk LA, Hanson EJ, Niemiller J, and Gleser GC: Effect of personality or sex of interviewer on sexual references, self-references, and affect scores. (Reported in Gottschalk and Gleser, 1969, pp. 261-267). Unpublished study, 1964.

Gottschalk, LA, Hausmann, C, Brown JS: A computerized scoring system for use with content analysis scales. *Comprehensive Psychiatry* 1975;16:77-90.

Gottschalk LA, Hoigaard-Martin J: The emotional impact of mastectomy. *Psychiatry Research* 1986; 17:1543-167.

Gottschalk LA, Hoigaard-Martin J: A depression scale applicable to verbal samples. *Psychiatry Research* 1986; 17:213-227.

Gottschalk LA, Hoigaard, JC, Birch H, Rickels K: The measurement of psychological states: Relationships between Gottschalk-Gleser Content Analysis scores and Hamilton Anxiety Rating Scale scores, Physician Questionnaire Rating Scale scores and Hopkins Symptom Checklist scores. In *Pharmacokinetics of Psychoactive Drugs: Blood Levels and Clinical Response*. Edited by LA Gottschalk and S Merlis Spectrum Publications Inc., New York, 1976, pp. 61-113.

Gottschalk LA, Hoigaard JC, Eckardt MR, Gilbert RL, Wolf RJ: Cognitive impairment and other psychological scores, derived from the content analysis of speech, in detoxified male chronic alcoholics. *The American Journal of Drug and Alcohol Abuse* 1983; 9:447-460.

Gottschalk LA, Holcombe RF, Jackson D, Bechtel RJ. Effects of anticancer chemotherapeutic drugs on cognitive function and other neuropsychiatric dimensions in breast cancer patients. *Cancer* (Submitted) 2002.

Gottschalk LA, Kaplan SA: Chlordiazepoxide plasma levels and clinical responses. *Comprehensive Psychiatry* 1972;13:519-527.

Gottschalk LA, Kaplan SM: A quantitative method of estimating variations in intensity of a psychologic conflict or state. *Archives of Neurology and Psychiatry* 1958;79:688-696.

Gottschalk LA, Kaplan, SM, Gleser GC, Winget CN: Variations in magnitude of emotion: A method applied to anxiety and hostility during phases of the menstrual cycle. *Psychosomatic Medicine*. 1962;24:300-311.

Gottschalk LA, Kapp FT, Ross WD, Kaplan SM, Silver H, MacLeod J, Kahn JB, Van Maanen EF, Acheson GH: Explorations in testing drugs affecting physical and mental activity. Studies with a new drug of potential value in psychiatric illness. *JAMA* 1956;161:1054-1058.

Gottschalk LA, Keating C: Influence of patient caregivers on course of patient illness. "Expressed emotion" and alternative measures. *Journal of Clinical Psychology*. 43:898-912, 1994.

Gottschalk LA, Kunkel R: Changes in emotional and intellectual functioning after total body radiation. In *Metabolic Changes in Humans Following Total Body Irradiation*. Edited by Saenger, EL, Friedman, BJ, Keriakes, JG, Perry, H. Report to Defense Atomic Support Agency covering February, 1960 through April, 1966 on Research Grant DA-49-146-XZ-315 prepared by the University of Cincinnati College of Medicine, Cincinnati General Hospital, Cincinnati, Ohio, 1966.

Gottschalk LA, Kunkel RL, Wohl TH, Saenger EL, Winget CN: Total and half body irradiation: Effect on cognitive and emotional processes. *Archives of General Psychiatry* 1969;21:574-580..

Gottschalk LA, Lolas F: Estudios Sobre Conducta Verbal. Santiago, Chile, Editorial Universitaria, 1987.

Gottschalk LA, Lolas F: The Gottschalk-Gleser content analysis method of measuring the magnitude of psychological dimensions: Its application in transcultural research. *Transcultural Psychiatric Research Review* 1989;26:83-111.

Gottschalk LA, Lolas F: The measurement of quality of life through the content analysis of verbal behavior. *Psychotherapy and Psychosomatics* 1992;25:1-9.

Gottschalk LA, Mayerson P, Gottlieb A: The prediction and evaluation of outcome in an emergency brief psychotherapy clinic. *Journal of Nervous and Mental Disease* 1967;144:289-295.

Gottschalk LA, Noble EP, Stolzoff GE, Bates DE, Cable C, Uliana RL, Birch H, and Fleming EW: Relationships of chlordiazepoxide blood levels to psychological and biochemical responses. In *Proceedings of an International Symposium on Benzodiazepines*. Edited by S.Garratini and A Leonardi. New York, Raven Press, 1972.

Gottschalk LA, Rey F: The emotional effects of physical or mental injury on Hispanic people living in the U.S.A. as adjudged from the content of their speech. *Journal of Clinical Psychology* 1990;46:915-922.

Gottschalk LA, Selin C: Comparative neurobiological and neuropsychological deficits in adolescent and adult schizophrenic and nonschizophrenic patients. *Psychotherapy and Psychosomatics* 1991;55:32-41.

Gottschalk LA, Springer KJ, Gleser GC: Experiments with a method of assessing the variations in intensity of certain psychological states occurring during two psychotherapeutic interviews. Ch. 7. In *Comparative Psycholinguistic Analysis of Two Psychotherapeutic Interviews*. Edited by Gottschalk, LA. International Universities Press, New York, 1961, pp 115-138.

Gottschalk LA, Stone WN, Gleser GC: Peripheral versus central mechanisms accounting for anti-anxiety effect of propranolol. *Psychosomatic Medicine* 1974;36:47-56.

Gottschalk LA, Stone WN, Gleser GC, Iacono JM: Anxiety levels in dreams: relation to changes in plasma free fatty acids. *Science* 1966; 153:654-657.

Gottschalk LA, Swanson JM, Hoigaard-Martin J, Gilbert R, Fiore C: Hyperactive children: A study of the content analysis of their speech. *Psychotherapy and Psychosomatics* 1984;41:125-135.

Gottschalk LA, Uliana RL: A study of the relationship of non verbal to verbal behavior: Effect of lip caressing on hope and oral references

as expressed in the content of speech. *Comprehensive Psychiatry*. 1976;17:135-152.

Gottschalk LA, Uliana RL: Further studies on the relationship of nonverbal to verbal behavior: Effect of lip caressing on shame, hostility, and other variables as expressed in the content of speech. In *Communicative Structures and Psychic Structures: A Psychoanalytic Interpretation of Communication*. Edited by Freedman N and Grand S. New York, Plenum Press, 1977, pp 311-330.

Gottschalk LA, Uliana RL: Profiles of children's psychological states derived from the Gottschalk-Gleser content analysis of speech. *Journal of Youth and Adolescence* 1979;8:269-282.

Gottschalk LA, Uliana RL, Gilbert R: Presidential candidates and cognitive impairment measured from behavior in campaign debates. *Public Administration Review* 1988;48:613-619.

Gottschalk LA, Uliana RL, Hoigaard JC: Preliminary validation of a set of content analysis scales applicable to verbal samples for measuring the magnitude of psychological states in children. *Psychiatry Research* 1979;1:71-82.

Gottschalk LA, Winget CN, Gleser GC: *Manual of Instructions for Using the Gottschalk-Gleser Content Analysis Scales: Anxiety, Hostility, Social Alienation-Personal Disorganization*. Los Angeles, Berkeley, University of California Press, 1969.

Gottschalk LA, Winget CN, Gleser GC, Lolas F: Analisis de la Conducta Verbal. Editorial Universitaria, Santiago, Chile, 1984.

Gottschalk LA, Winget CN, Gleser GC, Springer KJ: The measurement of emotional changes during a psychiatric interview: A working model toward quantifying the psychoanalytic concept of affect. In *Methods of Research in Psychotherapy*. Edited by Gottschalk, LA, Auerbach, AH. New York, Appleton-Century-Crofts, 1966.

Kaplan SM, Gottschalk LA, Fleming DE: Modifications of oropharyngeal bacteria with changes in the psychodynamic state. A preliminary study. *Archives of Neurology and Psychiatryt* 1957;48:656-664.

Gottschalk LA, Keating C: Influence of patient caregivers on course of patient illness. "Expressed emotion" and alternative measures. *Journal of Clinical Psychology.* 43:898-912, 1994.

Heszen-Nejodek I, Gottschalk LA, Januszek M. Anxiety and hope during the course of three different medical illnesses. A longitudinal study. *Psychotherapy and Psychosomatics.* 68; 304-312, 1999.

Kinney DK, Jacobsen B, Bechgaard B, Jansson L, Faber B, Kasell E, Uliana RL: Content analysis of speech of schizophrenic and control adoptees and their relatives: Preliminary results. In *Content Analysis of Verbal Behavior. Significance in Clinical Medicine and Psychiatry.* Edited by LA Gottschalk, F Lolas, LL Viney. Heidelberg, Germany, Springer-Verlag, 1986, pp 197-205.

Koch U, Schofer G (hrsg): Sprachinhaltsanalyse in der psychosomatischen und psychiatrischen Forschung. Grundlagen und Anwendungsstudien mit den Affektskalen von Gottshalk und Gleser. Weinheim und Munchen, Psychologie Verlags Union, 1986.

Kordy H, Lolas F, Wagner G: Zur stabilitat der inhaltsanalytischen erfassung von affekten nach Gottschalk und Gleser. *Z Klin Psychol Psychother* 1982;30:202-213.

Lavid N, Gottschalk LA, Grayden T, Bechtel RJ. Computerized content analysis of involuntary hospitalized psychiatric patients' requests to refuse hospitalization and medication. A preliminary study. *American Journal of Forensic Psychiatry.* (In press). 2002.

Lebell MB, Marder SR, Mintz J, et al.: Predicting schizophrenic relapse by a speech sample of family emotional climate. In *Psychiatry: A World Perspective.* Vol 3, Edited by CN Stefanis, AD Rabavilas, CR Soldatos, Excerpta Medica, Amsterdam, 1990, pp 802-807.

Lebovits AH, Holland JC: Use of the Gottschalk-Gleser Verbal content analysis scales with medically ill patients. *Psychosomatic Medicine* l983, 45:305-320.

Lewis HB: Using content analysis to explore shame and guilt in neurosis. In *The Content of Analysis of Verbal Behavior. Further Studies.*

Edited by LA Gottschalk. Spectrum Publications, New York, 1979, pp 831-856.

Lolas F: El estudio de la conducta verbal en clinica. *Revista Medica de Chile* 1986;114:247-251.

Lolas F, Gottschalk LA: Et metodo de analisis de contenido de Gottschalk y Gleser en la investigacion psiquiatrica. *Acta Psiquaiat Psicol Amer Lat* 1978;24:247-256.

Lolas F, Heerleen A: Verbal measures of anxiety and hostility under monological and dialogical conditions. *Psychopathology* (Basel) 1986;19:93-100.

Lolas F, Heerleen A: Content category analysis of affective expression in irritable bowel, duodenal ulcer and anxiety disorder patients. *Psychopathology* (Basel) 1986;19;309-216.

Lolas F, Kordy H, von Rad M: Affective content of speech as a predictor of psychotherapy outcome. In *The Content Analysis of Verbal Behavior. Significance in Clinical Medicine and Psychiatry.* Edited by LA Gottschalk, F Lolas, LL Viney. Heidelberg, Springer-Verlag, 1979, pp 225-230.

Lolas F, Mergenthaler E, von Rad M: Content analysis of verbal behaviour in psychotherapy research: a comparison between two methods. *British Journal of Medical Psychology* 1982;55:327-333.

Lolas F, von Rad M: The Gottschalk-Gleser affective profile. *Research Communications in Psychology, Psychiatry and Behaviour* 1977;2:231-234.

Lolas F, von Rad M: Psychosomatic disease and neurosis: A study of dyadic verbal behavior. *Comprehensive Psychiatry* 1982;23:19-24.

Lolas F, von Rad M: Communication of emotional meaning: A biopsychosocial dimension in psychosomatics. In *Life Stress.* Edited by SB Day. Von Nostrand Reinhold Publishing Co., New York, 1982, pp. 138-144.

Lolas F, von Rad M, Scheibler H: Situational influences on verbal affective expression of psychosomatic and psychoneurotic patients.

Journal of Nervous and Mental Diseases 1981;169:619-623.

Luborsky L, Docherty J, Todd T, Knapp P, Mirsky A, Gottschalk LA: A content analysis of psychological states prior to petit mal EEG paroxysms. *Journal of Nervous and Mental Disease*, 1975;160:282-298.

Maguire GA, Gottschalk LA, Riley GD, Franklin DL, Bechtel RJ, Ashurst J. Stuttering: Neuropsychiatric features measured by content analysis of speech and the effect of risperidone on stuttering severity. *Comprehensive Psychiatry*. 40:308-314, 1999.

Maguire GA, Riley GD, Franklin DL, Gottschalk LA. Risperidone and its effect on stuttering. *Journal of Clinical Psychopharmacology*. 20:479-482, 2000.

Malla AK, Kazarian SS, Barnes S, et al.: Validation of the five minute speech sample in measuring expressed emotion. *Canadian Journal of Psychiatry* 1991;376:297-299.

Malt EA, Berle J, Olafsson S, Lund A, Ursin H. Fibromyalgia is associated with panic disorder and functional dyspepsia with mood disorders. A study of women with random sample population controls. *Journal of Psychosomatic Research*. 49:285-289, 2000.

Malt EA, Ursin H. Mutilation anxiety differs between females with fibromyalgia, functional dyspepsia and healthy controls. *Journal of Psychosomatic Research*. (In press) 2002.

Muthuny FA: Gottschalk-Gleser auswertung von probandenauberungen im rahmen psychophysiologisher aktivierungsforschung. In *Sprachinhaltsanalyse in der psychosomatischen und psychiatrischen Forschung: Grundlagen und Anwendungsstudien mit den Affekstalen von Gottschalk und Gleser*. Edited by U Schofer and G Schofer. Beltz, Weinheim, Germany, 1986, pp. 178-197.

Perley J, Winget C, Placci C: Hope and discomfort as factors influencing treatment continuance. *Comprehensive Psychiatry* 1971;12:557-563.

Pilowsky I, Gottschalk LA: Relationships between Gottschalk-Gleser content analysis scores and

pain in patients with chronic pain syndrome. (Unpublished study), 1978.

Reynolds, WM. Review of Psychiatric Content Analysis and Diagnosis (computer software). In: BS Plake, JC Impara, LL Murphy (Eds.). *The Fourteenth Mental Measurements Yearbook*. Buros Institute of Mental Measurements. The University of Nebraska Press, 2001.

Russell SL: *The Measurement of Narcissism through the Content Analysis of Verbal Behavior*. Doctoral Dissertation, University of California, Irvine, California, 1989. Dissertation Abstracts. UMI Dissertation Information Service, 300 N. Zeeb Road, Ann Arbor, 1990. Michigan 48106.

Sabalesky DA, Demet EM, Chicz-Demet A, Gottschalk LA, Haier RJ: Platelet monoamine oxidase activity and evoked response as predictors of anxiety and depression derived from the content analysis of speech. *Journal of Psychiatric Research* 1990;24:165-175.

Schofer G: Das Gottschalk-Gleser verfahren: Eine sprachinhaltsanalyse zur erfassung und quantifizierung von aggressiven und angstlichen affekten. *Zeitschrift fur Psychosomatische Medizin und Psychoanalyse* 1977a;23:1-12.

Schofer G: *Gottschalk-Gleser Sprachinhaltsanalyse Theorie und Technik. Studien zur Messung Angstlicher und Aggressiver Affekte*. Weinheim, Germany, Beltz, 1980.

Schofer G, Balck F, Koch U: Possible applications of the Gottshalk-Gleser content analysis of speech in psychotherapy research. In *The Content Analysis of Verbal Behavior. Further Studies*. Chapter 48. Edited by LA Gottschalk. Spectrum Publications, New York, 1979, pp. 857-870.

Schofer G, Koch U, Balck F: The Gottschalk-Gleser content analysis of speech: A normative study. (The relationship of hostile and anxious affects to sex, sex of the interviewer, socioeconomic class, and age). In *The Content Analysis of Verbal Behaivor. Further Studies*. Edited by LA Gottschalk. Spectrum Publications, New York, 1979a, pp. 95-118.

Schofer G, Koch U, Balck F: Test criteria of the Gottschalk-Gleser content analysis of speech: Objectivity, reliability, validity in German studies. In *The Content Analysis of Verbal Behavior*.

Further Studies. Edited by LA Gottschalk. Spectrum Publications, New York, 1979, pp. 119-146.

Schofer G, Muller L, Von Kerekjarto M: Die differenzierung psychosomatischer krankheitsgruppen mit der Gottschalk-Gleser-sprachinhaltsanalyse. *Medizinische Psychologie* 1979;5:24-30.

Sciolla C, Cumsille F, and Lolas F: Analisis de contenido verbal. Una comparacion entre dos metodos. *Revista Chilenea de Neuropsiquiatria* 1986;24:20-30.

Selin CI, Gottschalk LA: Schizophrenia, conduct disorder and depressive disorder: Neuropsychological speech sample and EEG results. *Perceptual and Motor Skills* 1983;57:427-444.

Shapiro DH, Bates DE: The measurement of control and self-control: Background, rationale, and description of a control content analysis scale. *Psychologia--An International Journal of Psychology in the Orient* 1990;XXXIII:147-162.

Shapiro DH, Bates, DE, Greenzang TR, Carrere S: A content analysis scale applied to verbal samples of psychiatric outpatients: Correlation with anxiety and hostility scales. *Psychologia--An International Journal of Psychology in the Orient* 1991;XXXIV:86-97.

Silbergeld S, Manderscheid RW, O'Neill PH: Free association anxiety and hostility: View from a junior high school. *Psychological Reports*. 1975;37:495-094.

Stone WN, Gleser GC, Gottschalk LA, Iacono JM: Stimulus, affect and plasma free fatty acids. *Psychosomatic Medicine* 1969;21:331-341.

TenHouten WD, Hoppe, KD, Bogen JE, Walter DO: Alexithymia and the split brain. IV. Gottschalk-Gleser Content Analysis, an overview. *Psychotherapy and Psychosomatics* 1985;44:113-121.

TenHouten WD, Hoppe KD, Bogen JE, Walter DO: Alexithymia: An experimental study of cerebral commissurotomy patients and normal control subjects. *American Journal of Psychiatry* 1986;143:312-316.

Terrill TR, Friedman DG, Gottschalk LA, Haaga DAF. Construct validity of the Life Orientation Test. *Journal of Personality Assessment*. (In press) 2002.

Uliana, R: *Measurement of black children's affective states and the effect of interviewer's race on affective states as manifested through language behavior*. Dissertation for Doctorate in Psychology from the University of California, Irvine, 1976.

Uliana R: Measurement of black children's affective states and the effect of interviewer's race on affective states as measured through language behavior. In *The Content Analysis of Verbal Behavior. Further Studies*. Edited by LA Gottschalk. Chapter 7, New York, Spectrum Publications Inc, 1979, pp 173-210.

Viney LL: Content analysis: a research tool for community psychologists. *American Journal of Community Psychology* 1981;9:269-281.

Viney LL: Assessment of psychological states through content analysis of verbal communications. *Psychological Bulletin* 1983;94:542-563.

Viney LL: Expression of positive emotion by people who are physically ill: Is it evidence of defending or coping? In *Content Analysis of Verbal Behavior. Significance in Clinical Medicine and Psychiatry*. Edited by LA Gottschalk, F Lolas, LL Viney. Heidelberg, Springer-Verlag, 1986, pp 215-224.

Viney LL: A sociophenomenological approach to lifespan development complementing Erikson's sociodynamic apoproach. *Human Development* 1987;30:125-136.

Viney LL, Clarke AM, Bunn TA, Teak HY: Crisis counselling for ill or injured patients who are hospitalized. A report to the Commonwealth Department of Health. Canberra, Australia. University of Wollongong. pp 1-375, 1983.

Viney LL, Manton M: Sampling verbal behavior in Australia: The Gottschalk-Gleser Content Analysis Scales. *Australian Journal of Psychology* 1973;25:45-55.

Viney LL, Tych AM: Content analysis scales. Measuring psychosocial maturity: A new set of

tools for the clinical assessment of the elderly. *Journal of Personality Assessment* 1985;49:311-317.

Viney LL, Wang W: Psychosocial maturity of children in Australia and the Peoples' Republic of China. University of Wollongong, New South Wales, Australia (Unpublished paper), 1987.

Viney LL, Westbrook MT: Cognitive anxiety. A method of content analysis for verbal samples. *Journal of Personality Assessment* 1976;40:140-150.

Viney LL, Westbrook MT: Sociality: a content analysis scale for verbalizations. *Social and Behavioral Personality* 1979;7:129-137.

Viney LL, Westbrook MT: Measuring patients' experienced quality of life. The application of content analysis scales in health care. *Community Health Studies* 1981;5:43-52.

Viney LL, Westbrook MT: Psychological reactions to chronic illnesss-related disability as a function of its severity and type. *Journal of Psychosomatic Research* 1981;25:513-523.

Viney LL, Westbrook MT: Patients' psychological reactions to chronic illness: do they predict rehabilitation. *Journal of Applied Rehabilitation and Counseling* 1982; 13:38-44.

Viney LL, Westbrook MT: Patterns of anxiety in the chronically ill. *British Journal of Medical Psychology* 1982; 55:87-95.

Viney LL, Westbrook MT: Psychological states in patients with diabetes mellitus. In *Content Analysis of Verbal Behavior. Significance in Clinical Medicine and Psychiatry*. Edited by LA Gottschalk, F Lolas, LL Viney. Heidelberg, Springer-Verlag, 1986, pp 157-170.

Viney LL, Westbrook MT, Preston C: Some sources of alienation for drug addicts. In *Content Analysis of Verbal Behavior. Significance in Clinical Analysis of Verbal Behavior*. Edited by LA Gottschalk, F Lolas, LL Viney. Heidelberg, Springer-Verlag, 1986, pp 189-196.

Von Rad M, Drucke M, Knauss W, Lolas F: Alexithymia: a comparative study of verbal behavior in psychosomatic and psychoneurotic patients. In *The Content Analysis of Verbal Behavior. Further Studies*. Edited by LA Gottschalk. New York, Spectrum Publications Inc., 1979, pp 641-676.

Wang W, Viney LL: A cross-cultural comparison of Eriksonian psychosocial development: Chinese and Australian children. *School Psychology International*, 17:33-48, 1996.

Wang W, Viney LL: The psychosocial development of children and adolescents in the People's Republic of China: An Eriksonian approach. *International Journal of Psychology*. 32:139-153.

Westbrook MT: Positive affect: a method of content analysis for verbal samples *Journal of Consulting and Clinical Psychology* 1976;44:715-719.

Westbrook MT, Viney LL: Scales measuring people's perception of themselves as origins and pawns. *Journal of Personality Assessment* 1980;44:157-166.

Westbrook MT, Viney LL: Psychological reactions to the onset of chronic illness. *Social Science and Medicine* 1982;16,899-965

Winget C, Kapp F: The relationship of the manifest content of dreams to duration of childbirth in primiparae. *Psychosomatic Medicine* 1972;324:313-320.

Winget C, Seligman R, Rauh JL, Gleser GC: Social alienation-personal disorganization assessment in disturbed and normal adolescents. *Journal of Nervous and Mental Disease* 1979:167;282-287.