LABORATORY IN COGNITION & PERCEPTION

v3

INSTRUCTOR'S MANUAL

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Elizabeth Lofus provided the photographs used in the Metamemory experiment. Steven Smith created the animal drawings used in the Tip of the Tongue experiment. The line drawings included in the Implicit and Explicit Memory experiment appear with permission of Life Sciences Associates, Bayport, New York.

Overview

You do not have to read any further to use the software successfully. The few minutes it might take to examine this manual, however, may help save you hours later when you put the software to use in your class.

We begin the next section with a brief description of the ensemble of programs that your institution acquired as well as the different programs contained on the **Manuscript Mentor** disk that accompanies the *Student's Manual*.

We then turn to ways that you can fit the software into courses that might be titled **Laboratory in Cognition, Laboratory in Perception, Laboratory in Human Experimental Psychology, Statistics,** or **Research Methods**. The software is flexible enough to be used in a variety of ways, some of which are suggested here. We hope others are self-evident in the *Student's Manual*.

The third section describes our rationale for the particular experiments selected. Essentially, we were driven not simply by what we saw as the most important experiments in the field, but also by what we felt were easy experiments to replicate that would be amenable to migration to modern desktop computers. Testing in a variety of situations leads us to expect that robust effects can be obtained even in noisy laboratory environments.

To help you select and sequence the experiments most appropriately for your course, in the next sections we briefly describe each experiment, then highlight the key concepts and major theoretical points illustrated in each program. Key concepts are also listed in boldface at the beginning of each chapter in the *Student's Manual* and defined there, in context, so that the students can more easily grasp the central ideas within each experiment. This section shows you how to preview each experiment, without having to sit through a long data collection period.

We next tell you what your network administrator needs to know if you plan on installing the software on a local network, and we explain how these programs differ from a set of software tools.

Finally, we present and respond to some frequently asked questions about these materials.

Each of these programs has been tested repeatedly by the authors, naive and sophisticated undergraduates at small and large institutions, and by professional testers. In

many cases, the programs have also been tested by the researchers whose work was the inspiration for the software. We hope that you and your students enjoy using this software package as much as we do.

What the Package Contains

The *Institutional Software* is distributed as a single self-installing program downloaded from our Internet site or one CD-ROM. Your site license authorizes you to install the software only on a specific number of computers or to install it on a network that enables only a specific number of individuals to use the software concurrently.

To complement the collection of experiments, your software includes spreadsheet and graphing programs that require minimal instruction for students to master quickly. The data from each program are saved as an Excel file, which most current external spreadsheets can also translate readily. This spreadsheet also enables users to save the data as a plain-text (tab-delimited ASCII) file for use with external statistics programs. In addition, users can save the output of each experiment in an ASCII log file that provides detailed information about each trial (e.g., stimuli used, response made, response time, and so on).

The **Manuscript Mentor** disk, provided with the *Student's Manual,* provides suggestions for data analysis and for interpreting the outcomes of each experiment. It also gives explicit pointers to the appropriate literature. In addition, this disk provides a WYSIWYG word processor that formats an APA-style laboratory report and nearly automates adherence to the rules for citations in their reference section. Students can use the word processor on their disk for personal correspondence or for work in other courses, as well.

Because students do not always share our enthusiasm for research, we have tried to grab their attention with provocative opening paragraphs of each chapter. The *Student's Manual* provides a context, highlights key concepts, gives a clear purpose for the experiment plus a description of the design of a default experiment (generally, a replication of a published report). It also details how to customize the paradigm by including new stimuli, instructions, or changes to settings of various parameters.

Incorporating the Programs into Your Syllabus

The syllabus shown on the next two pages indicates how you might implement this software in a Cognition and Perception lab course for advanced undergraduates who have had a statistics, research methods, or cognition course. Students in many of these courses have a wide range of background knowledge and computer expertise. This software was designed to meet their needs. Students who have taken a greater number of preparatory courses in psychology will perhaps be familiar with many of the key concepts, but *very little previous knowledge* is required for your students to use these programs effectively.

In some programs, students' prior exposure to the paradigm is not a concern. For example, their familiarity with the illusions used in the Psychophysics experiment or prior knowledge of the effects of inspecting the stripes in the Perceptual Aftereffects experi-

ment have no effect on the data. In other situations, a little knowledge may be dangerous. For example, familiarity with the literature on brainstorming or hierarchical strategies illustrated in Ill-Defined Problems could contaminate the results. For this reason, we intentionally do not fully disclose the expected outcomes in the *Student's Manual*.

After providing the key concepts central to each experiment, the *Student's Manual* gives a brief historical perspective. The design and suggested procedures are all completely described in each chapter. Each experiment can be varied in many ways, but for each there is a default setting for every variable. These settings enable the student to click FILE, then START EXPERIMENT to launch any experiment.

Students need no supplementary reading about a particular experiment in order to understand what they are attempting to replicate and why they are serving as research participants. Whey they are to be "designated experimenters" (i.e, have responsibility for assembling, analyzing, and interpreting the data collected from all of the class members), the Suggested Readings contained on their **Manuscript Mentor** disk will help them to get started on a library search.

The syllabus also shows a second required book — the *Publication Manual of the American Psychological Association, Fourth Edition*. There are many student-oriented guides for APA-style, but we believe that students should learn this style directly from the original source. Much of the information contained in this publication implicitly deals with the treatment of human research participants, and the volume as a whole is an important book for anyone trying to understand how we do research.

The sample syllabus (a slight modification of one that we presently use) enables students to become actively involved as research participants in half of the experiments during a 15-week semester course. They devote about 30% of the course (in the latter part of the semester) to designing and executing an independent piece of research using one of the 20 experimental paradigms as a starting point.

A Sample Syllabus
Laboratory in Cognition and Perception
Term II, 199X

Instructor: Dr. Wilhelm Wundt
T.A.: E.B. Titchener, office hours TBA
Office: Lepzig Laboratory
Class particulars: **Class** meets M, W, & F (12:30-1:50)
Lab 11:30 - 12:20, on Tuesday

Required Texts: Ransdell, S.E., Marek, P., Lea, J., Kuntz, L.A., Flett, J. & Levy, C. M. (1997). Laboratory in Cognition and Perception, v3. Gainesville FL: Psychology Software Inc.
Publication Manual of the American Psychological Association, 4th Edition. (1994),

Course Description: This computer-based laboratory course gives you direct experience with a variety of phenomena in cognitive psychology, training in the design and conduct of psychological experiments, experience in collecting and reporting data collected in psychological research and practice in communicating about your work in a professional manner..

Course Work: Everyone will serve as experimenters as well as participants for each other's projects. Your first experiment will be based on a paradigm described in the lab manual. After creating a research proposal by the 9th week, we will conduct independent projects based on the More Advanced Projects. Class meetings will include discussion of research conducted in the weekly lab meetings. Your classmates depend upon the data you generateas much as you do on theirs; thus attendance is lab is required. Your assignments are described next:

(1) A Figure depicting your own results from Experiment 1
(2) A Table of your data from Experiment 1
(3) A Method section from Experiment 3
(4) An Abstract of Experiment 4
(5) For your own first experiment, you and a partner are responsible for analyzing the data and leading a class discussion following the suggested items presented on your *Manuscript Mentor* disk. You might want to use the graphing program that is part of the C&P3 software to create an "electronic slide" show to give your presentation a professional appearance.
(6) You will also create a formal report based on the same experiment you presented orally to the class. It must be word processed and prepared according to Publication Manual of the American Psychological Association as if you were planning to send it to the editor of a psychology journal. Your Manuscript Mentor disk has a word processing program that will enable you to focus the presentation of your results as well as your interpretation of them. It also makes it very easy to format your report correctly.
(7) After being a participant in several of the experiments, you'll be in a good position to generate some interesting, and perhaps novel, psychological questions about them. Assignment 7 is a research proposal that poses two or three research questions from any one of the C&P3 experiments that introduces one or more design or procedural changes. In addition, it includes predictions about the outcome of the experiment and your reasoning behind them.
(8) The last assignment is an formal research report based on the results of the **second experiment**. This will be a truly collaborative effort, including the data collection and analysis and preparation of the final report. We will have an informal research symposium where your research team will briefly describe your experiment to the rest of the class. We'll supply the pizza and soft drinks and will meet outside on the Terrace for the symposium, weather permitting.

Laboratory Reading and Written Assignment Schedule

Please read the Overview section of the lab manual before the first lab meeting. Before coming to the laboratory to conduct any experiment, you must read thoroughly the appropriate experiment chapter (at least as far as the section identified as What's Next). Assignment 6 (oral report) is interspersed throughout. Sections in the APA manual will be assigned periodically to facilitate written assignments.

Class Dates	Lab Topic	Assignment
1/15-17	Introduction Lab Scheduling Selection of Experiments	
1/22-24	Exp 1 Ch 1: Psychophysics	
1/29-31	Exp 2 Ch 3: Automatic Processing	Assmt 1
2/5-7	Exp 3 Ch 5: Attention	Assmt 2 Report Exp 1
2/12-14	Exp 4 Ch 8: Mental Rotations	Assmt 3 Report Exp 2
2/19-21	Exp 5 Ch 5: Retrieval from WM	Assmt 4 Report Exp 3
2/26-28	Exp 6 Ch 7: Individual Differences	Assmt 5 Report Exp 4
**********	Spring Break **********	
3/19-21	Exp 7 Ch 8: Implicit Memory	Report Exp 5
3/26-28	Exp 8 Ch 11: Metamemory	Reports Exps 6 & 7
4/2-4	Exp 9 Ch 15: Reasoning and Decision Making	Assmt 7
4/9-11	Exp 10	Report Exp 10
4/16-18	Exp 11 Ch 19: Mental Models	Report Exp 11
4/23-25	Exp 12 Ch 20: TOT	Report Exp 12
4/30-5/2	(no lab this week)	Assmt 8

Some experiments take longer to complete than others; to maximize exposure to the various paradigms, consider asking students to participate in two brief and unrelated experiments in one laboratory session. Alternately, consider using a brief experiment (such as several administrations of Automatic Processing) as the 5-10 minute interpolated task in an experiment that requires that amount of time between the acquisition and test phases (for example, Metamemory).

We've found that incremental assignments work very well. Students are often daunted by the need to prepare an APA-style research report for the first time. Creating an ab-

stract, then a method section, one component at a time, is considerably easier to handle. Consider having students initially examine their own data before they embark on an assignment that involves assembling and analyzing data from their classmates.

You might also use these programs in a research methods or statistics class. The statistical and methodological issues listed in the Key Concepts (grouped alphabetically below) at the beginning of each chapter will help you to make appropriate selections of experiments. In classes where the active participation of each student as a research subject is not appropriate, consider using an overhead projector or monitor coupled to a microcomputer to show some of these programs in traditional lecture or discussion-oriented classrooms.

How the Experiments Were Selected

We surveyed most of the current cognition textbooks to create the list of potential paradigms for inclusion in this package. To narrow the list of candidate experiments to a manageable number, we evaluated a number of variables simultaneously: the currency of the topic, the percentage of textbooks referring to the experiment, the feasibility of capturing the essence of the paradigm in software for current desktop computers, the robustness and magnitude of the reported effects, and whether an appropriate amount of data could be collected in a fairly noisy (either visually or acoustically, or both) environment within a 50-minute class period. We also assessed student interest, whenever feasible.

Within your own course, you might find it worthwhile to allow students to preview experiments briefly during the first week of class, and rank order them according to how much they would like to explore them as “designated experimenters.” This choice gives students a sense of ownership, which helps to sustain their motivation.

The Focus of the Experiments

Chapter 1 —Psychophysics — is included because it has been successfully used in all previous editions of this package as an introduction to the computer-based aspects of any research methods course. This program yields strong, easy to replicate results and lets the student focus on the methodologies involved and interacting with the computer, rather than an intense theoretical discussion of the phenomena. Students can concentrate on the straightforward way one can objectively measure a subjective experience. Three different illusions (Müller-Lyer, Poggendorf, and Horizontal-Vertical) can be studied using the methods of limits or constant stimuli. Rewards and penalties can also be imposed so that students can differentiate between sensitivity and bias.

Chapters 2 and 3 — Perceptual Aftereffects and Feature Detection— robustly demonstrate several key phenomena in perception. Chapter 2 examines the McCollough effect, a long-lasting aftereffect that occurs after inspection of horizontal and vertical colored stripes. Chapter 3 is based on Triesman and Gelade's research on feature integration theory using a letter-recognition task.

Chapter 4 — Automatic Processing — is based on the classical Stroop test. Several languages, in addition to English, are available for stimulus presentation. The experiment also allows users to study the growth of automaticity by teaching participants new names for the basic colors. Chapter 5 — Attention — is based on the Schriffin-Schneider paradigm, illustrating the differences between automatic and controlled processing.

Chapters 6 and 7 — Retrieval from Working Memory and Individual Differences — examine working memory. Chapter 6 illustrates the basic Sternberg memory scanning task and is a good place to begin a discussion of the logic of additive factors. Chapter 7 is our only example of a purely correlational study. It illustrates several new measures of complex spans, such as reading and speaking spans, as well as a new version of a standardized reading comprehension test.

Chapters 8 and 9 — Mental Rotations and Procedural Learning — represent complex and unconscious processing in distinctly different ways. Chapter 8 show the mental rotation effect, based on Shepard's work on analog representations. Chapter 9 is a variant of Berry and Broadbent's research that shows how people can acquire mastery of complex rules in a brief period of time, and yet be quite unable to verbalize those rules.

Chapters 10, 11, 12, and 13 examine long-term memory in various ways. Chapter 10 — Implicit and Explicit Memory — demonstrates the important distinction between explicit and implicit recall performance. Chapters 11 and 12 — Metamemory and False Memories — complement the focus of newer textbooks on memory in real-world settings. They connect with concepts about memory your students are likely to read about in popular media accounts. Chapter 13 — Abstracting Linguistic Ideas — illustrates Bransford and Franks' paradigm where people "recall" central ideas (that are never presented) better than they remember peripheral ideas that they actually studied.

Chapter 14 — Categorization uses digitally morphed images to display a range of facial expressions (e.g., *happy* to *sad*) in an ABX comparison task, an identification task, and a goodness rating task. They illustrate how expressions of emotion are perceived categorically.

Chapters 15, 16, and 17 make this set of programs unique for their strong coverage of problem solving and reasoning research. These chapters represent major methods and theories in this area. Chapter 15 — Reasoning and Decision Making — deals with Kahneman and Tversky's work on probability judgments under risky choice situations. Chapter 16 — Well-Defined Problems — carries forward from our earlier editions because students find it so intrinsically interesting. Chapter 17 — Ill-Defined Problems — is based on a clever methodology developed by Butler that is too new to be included in available textbooks.

Chapters 18, 19, and 20 represent some of the most recent areas of study in cognitive psychology. Chapter 18 — Parallel Distributed Processing — is introduced as a representation of a major new approach, but differs from the other programs in this ensemble, because the student is not a research participant in the usual sense of that term. Chapter 19 — Mental Models — is based on Bower and Morrow's work on text comprehension, and Chapter 20 — Tip of the Tongue — is based on Smith's new techniques for inducing

TOT states. Both of these illustrate significant new approaches for studying basic processes in cognition.

Previewing Experiments

You need not sit through each of these experiments in order to preview them. At any time during the administration of an experiment, you can click FILE|EXIT, and the experiment will terminate. If you need to preview a multipart experiment quickly, try setting the number of trials, replications, and duration to the smallest allowed.

Key Concepts by Chapter

The following is a listing of the concepts introduced at the beginning of each chapter, grouped according to whether their emphasis is content, methodology, or statistics. The numbers shown are chapter numbers.

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Using the Software on Your Network

The installation software prompts you for the destination drive and directories that your network server will use to store the software. For this software to operate properly, it needs to know where critical program units are stored.

- All files with OCX, VBX, and DLL extensions will generally be installed in \Windows\System subdirectory.
- Files with BMP or JPG extensions will be stored in a \C&P3 \PICTURE subdirectory.
- Program files with EXE extensions be stored in a \C&P3\BIN subdirectory.

Ask your network administrator to set the attributes of all files in the \PICTURE and \BIN subdirectories to be read only and shareable.

If you assign a drive and subdirectory with read/write privileges to students for saving data, every administration of a given experiment saved with the same filename will aggregate the data. If students conduct separate projects and need to keep their data files separate from other students', they need to agree on rules to avoid using the same file names. Each student might use, for example, the last 8 digits of their Social Security number plus the .XLS extension. Alternately, students might save their data on a single diskette that is moved from computer to computer after the research participants have left. On a network, it is generally practicable to create a folder or directory for each student in the class.

How these Programs Differ from Software "Tools"

These programs were designed for environments where instructors wanted a turnkey system — i.e. neither they nor their students would have to learn much about the variations possible in the experiments in order to conduct replications of the original experiments described in each chapter. Purely turnkey programs promise no more than this.

We also wanted to address students and instructors who needed to vary the basic paradigms in numerous ways, simply and conveniently setting up the instructional equivalent of a large research initiative. We hope that we have accomplished this with the Part Cards for each experiment.

In addition, we responded to the requests of students who, along with their mentors, have asked us over the years to "open up" our approach to enable them to incorporate their own stimuli and instructions. We have done this for each of the programs in this collection.

But this collection of programs is not a set of software tools in the sense that MEL (Microcomputer Experimental Laboratory) is. Our goal was not to fill a toolbox with options that could be freely combined. This would have added greatly to our programming efforts, and would have made our programs much more difficult to learn how to use. But we hope you will remind your students that, if they are sufficiently flexible, they can use many of these experiments for purposes neither envisioned by us nor the research team that devised the paradigm. For example, the experiment described in Chapter 8, Mental Rotations, is based on Roger Shepard's classic paradigm that required participants to compare two objects that differed in orientation and decide as quickly as possible if they represented the same shapes. While our instantiation enables replication and extension of the original research, the underlying paradigm is basically one that involves the simultaneous presentation of two pictures and seeks a speeded binary decision. Any images could be used, even if the interest was not in rotation effects[1]. Similarly, False Memories could used to present any collection of lists of words for memorization.

Frequently Asked Questions

What level of computing expertise should my students have to use the software?

Students need only modest experience in maneuvering a mouse through an object-oriented environment. Fortunately, most undergraduates will come to you with this knowledge, but you should be alert to apprehensions among those who need special assistance. You might suggest that novices try the Quick Start tutorial from the Marble Screen to become acquainted with the operation of the various buttons, scroll bars, and so forth. The tutorial assumes only that they can use a mouse.

We schedule simple experiments such as Well-Defined Problems as the first lab, primarily to enable students to become familiar with the operation of their computer. It may be useful to advise about proper care of the **Manuscript Mentor** disk; students who slide open the spring-loaded door to examine the contents are asking for trouble!

Because not all students are proficient touch-typists, wherever recall data are collected, we provide one of two ways for students to enter their reports: (1) Where recall is used to determine the participant's mastery of the materials and readiness for the major experiment (e.g., in Mental Models), users need to type only the first four characters of the word; the

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[1] The program does no rotation of stimuli. The sample stimuli were rotated by in an external program and saved in a file that the Mental Rotations experiment accesses.

program completes the word for them. (2) When the recall data are the object of study (as in False Memories), the program will processes each entry with a spelling checker to minimize correct typographical errors.

Why do some programs offer more Part Cards than others?

Some contain many cards, each a duplicate of the other, to enable students to set up multipart within-subjects experimental designs. In contrast, where the situation calls for students to study some materials, wait for a specified duration, and then be tested, there may be only three Part Cards (one each for study, interpolated activity, and testing).

After they run the default experiments, what do the students do next?

They should refer to the literature that we direct them to read and consider ways that they can extend those studies using this software. After collecting data in the default experiments, students should be encouraged to explore the experimental variations built into the Part Cards and the options on the Custom Setup Card to configure entirely new experiments. Consider giving students access to these programs in the lab for their senior thesis or other independent research projects.

How do we combine data for different research participants?

If the researcher uses the same filename each time the experiment concludes, the data will automatically be combined on the drive specified (network or local). If data for a particular experiment exist in several files or on multiple diskettes, from the Spreadsheet, click the FILE|COMBINE DATA options on the Marble Screen to merge the data into a single file. Users cannot combine data from unrelated experiments (e.g., Mental Rotations and Attention) into a single file.

Do the experiments provide practice trials?

Some do. If these are needed elsewhere, change the default experiment so that the minimum number of responses are collected, and use those opportunities as practice. Alternately, use the default number of trials, and exit the program without saving data. Then restart the experiment.

What happens if a student has to leave for another class before finishing an experiment?

Users can quit at any time and either save the data collected to that point or not. If the experiment is nearly complete, we advise saving the data, but making a note to mark the data file as being an incomplete.

In some experiments, e.g., Mental Rotations, students perform in several, independent parts. In such cases, a student might quit after performing two of the three parts, save the data, then return at another time to complete the remaining component. In other multi-part experiments, independence is not a safe assumption and, therefore, it is not possible to resume on a later day at the point where a user previously quit.

How can I test for long-term memory in an experiment?

When this might be an important issue (Metamemory, Implicit/Explicit Memory, False Memories, Perceptual Aftereffects and Mental Models), users can turn off all of the Part Cards except those for the test needed. When the data are saved, the file will not contain information about the duration of the retention interval. It will indicate when the final test occurred, but the researcher must calculate the interval manually.

How can we incorporate information about external variables — such as the gender of the research participant — into the data file?

An easy way is to use M or F as part of the Subject ID that is requested before the experiment begins. The Subject ID is saved to the data file.

More generally, users can add any number of categorical or numeric variables to a data set in the C&P3 spreadsheet. Students can use these variables to combine data within categories, e.g., to combine all of the scores of the left-handers separately from the right-handers so that the user can plot handedness as a parameter on a graph.

Can students print out their own results after participating in an experiment without exiting the program?

Once the data are saved, the programs normally exit to the Marble Setup Screen. From there, student access the C&P3 spreadsheet to examine, graph, and print their data.

How does the self-contained spreadsheet differ from a commercial spreadsheet?

It contains only the functions most likely to be needed by students in the target courses. Thus, it cannot compute a depreciation schedule, but it can calculate such statistics as means, medians, variances, standard deviations, standard errors and regression lines. Its beauty lies in its simplicity for student use.

Because this is only a partial implementation of Excel, it does not accept as input files that were saved in an Excel format by other spreadsheets, such as Quattro. Therefore, if it is necessary to modify an .XLS data file from one of these experiments in a commercial spreadsheet, save the

file as an ASCII file for the C&P3 spreadsheet to open it again successfully.

What kind of graphics output can the software provide?

We provide for line and XY graphs, as well as 2- and 3-dimensional bar graphs. Most of the graphing options available in commercial spreadsheets are supported. We have reduced the power (and complexity) of these spreadsheets, building in ease of use, instead. For example, to create a basic graph, the user must merely (1) click on the levels of independent variable displayed in one box, (2) click on the dependent variables shown in a second box, (3) then specify in the same way, in a third box, the other parameters over which the data aggregation is to occur (e.g, Women/Men, Subjects 1/2/3/4, Positive Responses/Negative Responses).

The labels for variables on the spreadsheet are at times, obscure. Is there a fuller description somewhere?

Yes. While viewing the C&P3 spreadsheet showing the data set, click HELP. Read the descriptions from the screen or print them out.

The recommendations to students for data analysis and interpretation are on the* Manuscript Mentor *disk. Is there some way for them to print out this information?

The **Manuscript Mentor** disk enables users to print this information for any experiment whenever they need it.

What printers does the software support?

The software sends the output to any printer driver that you already have installed on your Windows system.

Is a mouse needed?

Generally, yes. Whenever possible, we have designed the software to respond to mouse clicks. **In many experiments, the researcher can also specify keyboard responses for users.** For example, in any experiment requiring timed Yes/No or Same/Different responses), the researcher can specify any set of keyboard keys that will be appropriately recognized.

How reliable is the RT data?

Independent tests of our high resolution timer indicate that accuracy is 10 msec or better. The experiments included here typically result in differences that are 5-10 times the resolution of this timer.

Can I use my own scanned images?

Yes, if they are saved as BMP or JPG files. You will need access to external software that enables you to enlarge or reduce images so that the pictures will fit into the display area provided. For example, Mental Rotations requires 7 images, each approximately 2.25 by 2.25 inches. Save the 7 images as 256-color bitmap (BMP) files.

It is very important that custom images be stored either on the network drive or on a local drive (c: or a:) that the program can access. When the user saves a custom setup, the setup file stores the path information needed to find the images. It does not save the images themselves. Thus, if your environment is not networked, and several students need to use the custom images on separate machines at the same time, users must have the images on either the hard drive of their machine (in the path named in the Custom Setup file) or their floppy disk. Generally, we discourage relying on using images stored on floppies because of their slower transfer times.

Can I leave my screen saver programs running while these programs are in use?

We discourage allowing screen savers to run in the background with these programs. In some experiments, participants may spend a rather long time crafting their responses (e.g., new ideas in the Ill-Defined Problem experiment). If your screen saver appears suddenly, they may lose their line of thought. They also may not understand how to make the new image disappear so that they can resume work in the experiment. In addition, on some displays, the color rendering may be disturbed badly when a user resumes work on these programs after a screen saver image has appeared.

What does my Network Administrator need to know about these materials?

Advise this individual that all files in the CP3\BIN and CP3\PICTURE folders must be shareable and read-only. Network Administrators will know what these files do and how to assign these privileges. The directory that is established for storing .XLS data files and .LOG (auto logging) files must give users read/write privileges.

Sometimes when I use the programs on a network I receive a message that says "File Locked." What does this mean?

This occurs rarely, and only in a networked environment. It means that someone else is accessing the same program at the same time you are, or another Windows program has access to the same program. In the first case, after a few seconds' pause (depending upon traffic on your network), your program should resume. Dealing with the second case can be more complex, but the simple answer is that you must determine who is using the file and wait for it to be closed. You might be the one who is the culprit if, for example, you minimize the window that displays a program, then start another program — perhaps a spreadsheet or word processor — that accesses some of the same information. This is not a defect in our code; it is the result of the ways that shared files are generally handled in Windows environments.

How to I obtain software support for these programs?

Send an email message to SUPPORT@psychologysoftware.com.