4 How to Be Fair with Participants

Do unto others as you would have them do unto you.

MATTHEW 7:12

Our data show that the social structure of competition and reward is one of the sources of permissive behavior in experimentation with human subjects; the relatively unsuccessful scientist, striving for recognition, was most likely to be permissive.

B. BARBER (1976)

Oh, what a tangled web we weave,
When first we practice to deceive!

SIR WALTER SCOTT

The human mind has no other means of becoming acquainted with the laws of the organic world except by experiments and observation on living animals.

IVAN P. PAVLOV

From an ethical point of view, we all stand on equal footing—whether we stand on two feet, or four, or none at all.

P. SINGER (1985)

Now that you have an idea for an experiment, you are ready to begin planning it in more detail. First, however, we need to consider the issue of ethics. As experimenters we could be unethical in at least two ways: We could mistreat the people or animals whose behavior we are measuring. We could also mistreat the body of knowledge that we are trying to establish—in other words, treat our science unfairly. In this chapter we discuss treating participants fairly; in the next chapter we discuss treating science fairly.

Society as a whole, and the scientific community in particular, has agreed on a set of rules by which we must do our research. Some of these rules are unwritten, such as the basic rules of courtesy. The assumption is that such rules are so obvious that everybody understands them. Other rules are written, such as *Ethical Principles of Psychologists and Code of Conduct* (American Psychological Association [APA], 2002) and *Ethics in Research with Human Participants* (Sales & Folkman, 2000). These rules are continually revised as society's conception of

the role of experimentation and the rights of an individual change. In the first part of this chapter, we consider the relationship between the person doing the experiment and the one being experimented on, including some basic courtesies in the relationship. Then we examine how this relationship can affect the outcome of an experiment. We also explore alternative experimenter–participant relationships. Finally, we consider the ethics of treating animals fairly.

■ Treating Human Participants Fairly

Because the purpose of doing research in psychology is to understand behavior, we will usually be interacting with humans (and in some cases animals). Traditionally, psychologists have referred to the people who provide the behavior as *subjects*. The early forefathers and foremothers of psychology probably liked this term because it sounded scientific and the subjects of the research were humans. Unfortunately, the term also may imply that people are subject to the experimenter's will, or even worse, subjected to it! Back in the 1930s it was suggested that the term *experimentee* should be used in place of *subject*, but the suggestion never caught on (Rosenzweig, 1970).

This discussion may seem pretty trivial to you: What's in a word? In this case, the word *subject* reflects the nature of the relationship between this individual and the experimenter and suggests certain ethical considerations. Subjects are passive and react to conditions of an experiment much as chemicals passively react when combined in the laboratory. For these reasons, in 1994 the APA recommended that the accepted terminology be changed, and those who were formerly called *subjects* be called *participants*. The APA felt that this term properly acknowledges the help that our participants give us by participating in our research and gives them a more equivalent status to the experimenter. As you will see in Chapter 13, in writing research reports it is best to call the participants what they are: students, children, women, and so forth, but the appropriate generic term is participants.

The use of the term participants rather than subjects is not universally accepted. For instance the Psychonomic Society allows its authors to ignore this rule. Roddy Roediger, the former president of the American Psychological Society (now the Association for Psychological Sciences), vehemently opposes the use of the term participants for subjects and claims to have special dispensation for his articles submitted to APA journals because of a delicate condition he describes in a letter to a copyeditor of APA, part of which I quote:

> I should point out that I am a member (in fact, the founder) of a group of Sufferers of Participant Phobia (SPP). Because I have had to survive the use of the word participant in many APA journals . . . I am also a member of Participant Phobia Syndrome Survivors (PPSS). Use of the word participants in our journals has caused me mental anguish, has produced undue stress, and has caused me to write this letter and seek help from a support group (other experimental psychologists who think the language change an abomination . . .). (Roediger, 2004)

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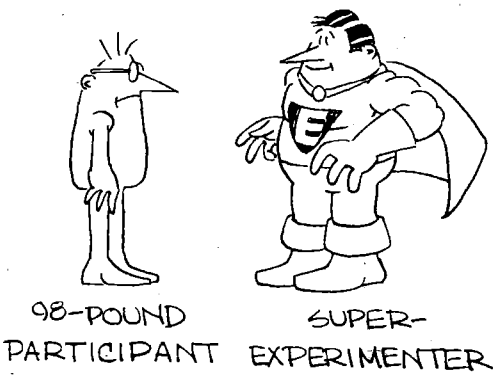
Obviously, this letter overstates the case with a bit of tongue-in-cheek humor, but it does express a legitimate concern some investigators have about the science of psychology becoming oversensitive to what they feel are certain pressure groups having political rather than scientific agendas.

In the early history of experimental psychology, nobody worried about what to call the people who were experimented on because the experimenter and the participant were the same person. In those days, most psychologists reported their own internal experiences as the dependent variable in their experiments. Believing that only time and training made it possible to become aware of these internal experiences, experimenters considered themselves their own best participants.

Later in the history of psychology, many experimenters came to believe that verbal reports of internal events were inappropriate data for the science of psychology. Arguing that being objective and subjective at the same time is not possible, these experimenters started a revolution in psychology. Some psychologists, overreacting to the revolution, decided that only animals were appropriate for psychology experiments. If you think verbal reports of a participant are not appropriate subject matter, then pick one who cannot talk![1] During this era, the rat became a prime participant for experimentation. Other investigators felt that although experimenters were too experienced to be experimented on, rats were rather unlike most humans. What was needed was a naive human. The naive human chosen was the college student. College students are the participants in 70% to 85% of published research (Schultz, 1969; Smart, 1966) and in as much as 90% of research conducted by university psychology departments (Jung, 1969).



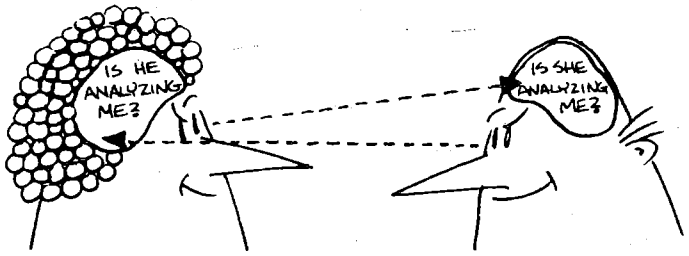
According to the latest view, a participant is supposed to be a naive, well-motivated observer who will react to experimental manipulations in an uncontaminated way. Yet, as we will see, participants are not uncontaminated observers. They usually have definite ideas about the experiment they are serving in, and they attempt to achieve specific goals that are often different from the experimenter's.

Humans (even college students) also have certain legal and moral rights. A physicist can take the block of wood from the inclined-plane experiment and drop it, hammer on it, swear at it, kiss it, or do any number of things with it. Although his colleagues may think he is pretty weird, they would not have him arrested or throw him out of the profession. Psychologists, however, must preserve their participants' rights at all times.

[1] OK, I am taking a bit of liberty with history here. I will discuss some better reasons for using animals in research later in this chapter.

The nature of the experimenter–participant relationship makes participants particularly vulnerable because the experimenter usually has most of the power. For example, many individuals serve in experiments to satisfy part of a psychology class requirement. Under these circumstances, students may feel that their course grade will be affected if they fail to do as the experimenter asks. On the other hand, if people are paid for their services, they may feel that noncooperative behavior will earn them less money. Finally, if individuals volunteer for experiments because they believe they can advance the science of psychology, they may feel that society will benefit from their cooperation. In any of these cases, participants see the experimenter as having the ultimate power to evaluate or manipulate their behavior.

In addition to these academic, monetary, or altruistic motives for cooperating with the experimenter, participants may also share the commonly held opinion that psychologists have a mysterious bag of tricks for determining whether someone is cooperating. The first three sentences between a psychologist and a stranger illustrate this belief: "What do you do for a living?" "I'm a psychologist." "Oh, are you analyzing me?" For some reason, many people believe that every psychologist has X-ray vision and can look deep into their minds and find out what they are thinking. They believe they had better cooperate or the experimenter will get 'em! This myth again helps stack the experimenter–participant relationship in favor of the experimenter.



RULES OF COURTESY

To unstack the relationship a little, experimental psychologists need to follow a code of behavior that treats their participants with respect and dignity.

As a new experimenter, you should hang a sign in your experimental room (an imaginary one is OK) that says "Participants are humans too!" Participants deserve the same courtesies you would give anyone who offered to help you with a project. Some simple rules of courtesy you should follow are:

1. *Be present.* Too often experimenters forget that they have a participant signed up or fail to notify the individual if the equipment has broken down or if the experiment has been delayed or called off for some other reason. Once a person signs up for an experiment, you should make every effort to fulfill your obligation to be present for the experiment.

2. *Be prompt.* A participant's time is valuable too. Don't waste it.
3. *Be prepared.* You should rehearse all phases of the experiment prior to meeting any participant. Not only is it discourteous to do otherwise, but also if you stammer over the instructions, tinker with the equipment, and generally fumble and mumble your way through the experiment, participants may become so confused or disgusted that they perform poorly.
4. *Be polite.* Unless the experiment calls for it, ask your participants to do something; don't order them. Make liberal use of the words "please," "thank you," and "you're welcome."
5. *Be private.* Treat all information that a participant gives you within an experimental context as confidential. Be discreet not only about what the individual tells you but also about how he or she performs on the experimental task. Federally funded grants are specific about what information you may obtain, how you may use that information, and how you may code and store it. If possible, eliminate participants' names from data sheets, and use a method that will prevent others from discovering the identity of individuals.
6. *Be professional.* You need not be so sober and stiff that your participants feel uncomfortable, but do not be so casual and flippant that you convince them that you don't care much about the experiment. They won't care either! Nor is an experiment the proper place to make dates, hustle golf partners, sell insurance, or use the experimenter–participant relationship for any purpose other than research.

These rules seem simple enough, but not all ethical issues concerning human participants are so straightforward. More controversial issues, such as "What constitutes informed consent?" and "Should mental stress be permitted?" are discussed at length in *Ethical Principles in the Conduct of Research with Human Participants* (APA, 2002). However, no publication can cover all possible ethical issues, and many experiments involve "close calls" where an unbiased opinion is required. For these reasons research-oriented institutions have **institutional review boards,** often abbreviated as IRBs.[2] These IRBs are made up of experienced researchers and sometimes physicians and other technical experts. All research using human participants should be screened by such a board.[3] Typically, the researcher fills out a form that contains a

[2] The National Institutes of Health require IRBs for all research funded by them. They published the guideline "Protecting Human Research Subjects: Institutional Review Board Guide" (*NIH Guide*, Volume 22, Number 29, August 13, 1993) that is designed to assist review board members, researchers, and institutional administrators in fulfilling their responsibilities. Copies can be obtained from the U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250 (reference GPO Stock No. 017-040-00525-3).

[3] In some cases, for courses that use a book such as the one you are holding, the instructor can convince the IRB to let the instructor evaluate classroom experiments for ethical considerations. When convincing the IRB, the instructor tends to be conservative about what will be approved. Although from time to time a course experiment is important enough to publish, the primary purpose of most of the experiments is to train students to do research. In most cases, the students' training can be accomplished as well with a low-risk experiment as with a high-risk experiment. So if you are planning a classroom experiment in which participants take a handful of drugs and then disclose their kinkiest sexual fantasies to an audience . . . forget it!

number of questions, such as "Will participants be asked to give informed consent?" and "Will confidentiality of the data be maintained?" This form also asks the researcher to describe briefly the research being proposed. The members of the board pay particular attention to the issue of potential physical or psychological harm to participants. It is unrealistic to expect that the risk of harm can be reduced to zero in any piece of research; a participant may break a leg tripping on the carpet. However, the review board's task is to make sure that the risk of harm is minimized. And when known risks are a necessary part of the research, the board's job is to decide whether the benefits likely to be derived from the research outweigh these risks.

Such review boards certainly help eliminate or improve many potentially unethical investigations. However, IRBs in the biomedical field have themselves been the subject of research, for it has been found that a significant minority of people who serve on such boards are poor at balancing the risks and benefits of human research (B. Barber, 1976). A large majority of board members surveyed had received no formal training in research ethics.

Some psychologists argue that there is little evidence that IRBs have been effective in reducing the risk to human participants (Mueller & Furedy, 2001). Some also feel that IRBs can become so picky that they encroach on intellectual inquiry in the social sciences. Others, such as Tom Puglisi (2001), the former director of the federal government's office that oversees IRBs, believe that IRBs serve a necessary purpose and that a proper reading of the regulations makes much of social and behavioral sciences research exempt from the regulations. In other words, when most psychologists submit their research proposals to an IRB, they should be stating why the research is exempt from regulation rather than trying to justify doing the research. Regardless of your opinion about the usefulness of IRBs, you should realize that the ultimate responsibility for doing ethical research still lies with you, the experimenter.

INFORMED CONSENT

One of the issues of concern to IRBs and to you is **informed consent.** Before they consent to participate, participants are entitled to be informed about the factors that might influence this decision. Once they have been so informed, the researcher must document their consent, usually in writing. Although informing participants and obtaining their consent may seem to be pretty straightforward, a number of factors may cloud the issue—for example, documenting that the information given was understandable, ensuring that participants in a subordinate position are not pressured to participate, or, for some participants, determining whether they are capable of making an informed decision. *Ethical Principles of Psychologists and Code of Conduct* (APA, 2002) goes into some detail about such issues:

> 8.02 Informed Consent to Research
> (a) When obtaining informed consent as required in Standard 3.10, Informed Consent, psychologists inform participants about
> (1) the purpose of the research, expected duration, and procedures;

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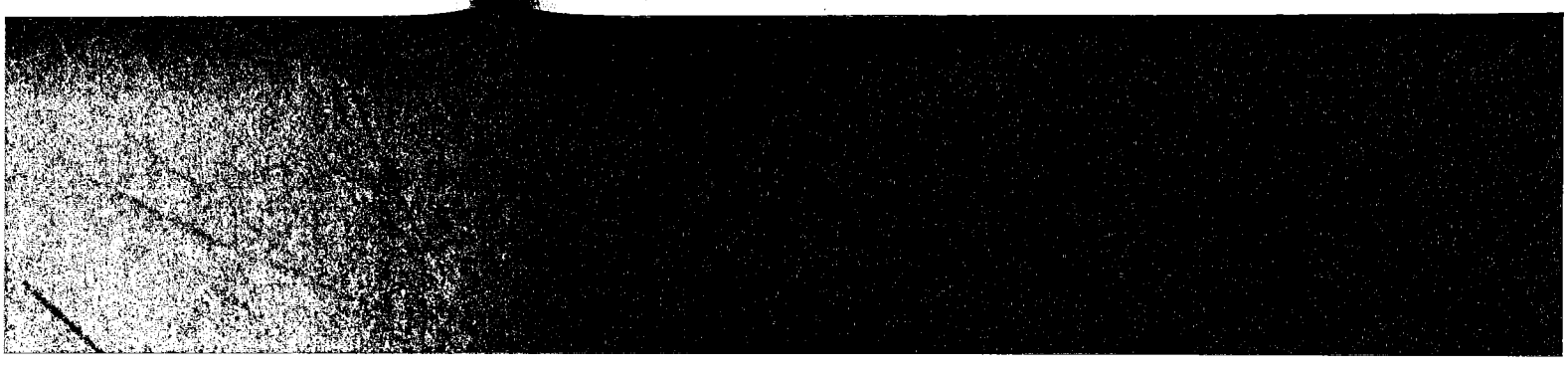


(2) their right to decline to participate and to withdraw from the research once participation has begun;
(3) the foreseeable consequences of declining or withdrawing;
(4) reasonably foreseeable factors that may be expected to influence their willingness to participate such as potential risks, discomfort, or adverse effects;
(5) any prospective research benefits;
(6) limits of confidentiality;
(7) incentives for participation; and
(8) whom to contact for questions about the research and research participant's rights. They provide opportunity for the prospective participants to ask questions and receive answers.

The "Ethical Principles" also say that there are conditions under which informed consent is not required; however, you still usually need to get the approval of an IRB to ensure that your interpretation is correct:[4]

8.05 Dispensing With Informed Consent for Research
Psychologists may dispense with informed consent only
(1) where research would not reasonably be assumed to create distress or harm and involves
(a) the study of normal educational practices, curricula, or classroom management methods conducted in educational settings;
(b) only anonymous questionnaires, naturalistic observations, or archival research for which disclosure of responses would not place participants at risk of criminal or civil liability or damage their financial standing, employability, or reputation, and confidentiality is protected; or
(c) the study of factors related to job or organization effectiveness conducted in organizational settings for which there is no risk to participants' employability, and confidentiality is protected or
(2) where otherwise permitted by law or federal or institutional regulations.

Once you are comfortable that you have provided a means for your research participants to give informed consent, you need to consider the nature of the experimenter–participant relationship that will be set up in your experiment. The nature of this relationship is important because it affects not only the participant's rights but also the experimental outcome. Although experimental psychologists like to pretend that participants in psychology experiments are neutral creatures reacting in a sterile, controlled environment, most know that such is not the case. In the next section we consider in more detail how the experimental situation can influence the outcome of an experiment.

[4] IRBs seem to have particular trouble believing that when 1b is true, no harm expected and an anonymous questionnaire, you do not need an informed consent form. I have seen more arguments about this issue at board meetings than any other.

DEMAND CHARACTERISTICS

When participants show up for an experiment, they have little idea what they will be required to do, but they are usually interested in the experiment and want to know exactly what it is about. Experimenters in turn are often secretive about their intention, which prompts the participants to try to determine what the experiment is really about from clues the experimenter gives them. The experiment then becomes a problem-solving game.

These clues that influence participants in the experimental situation have been called **demand characteristics** because they demand certain responses (Orne, 1962). While the experimenter provides many such clues, participants also bring demand characteristics with them to the experiment. If they have taken a psychology course, have read about psychology experiments, or have even been told about the experiment by a friend, they may bring the following expectations with them: The experimenter is going to shock me. The experimenter is trying to find out how intelligent I am. The experimenter is going to trick me into revealing something nasty about myself.

Sometimes these notions are so overpowering that a participant cannot be swayed from them. A participant in one of my experiments was once required to memorize a set of words presented to him through earphones. Shortly after starting the experiment, he tore off the headset and shouted, "This thing is shocking me!" Thinking he might be right, I carefully measured for any current passing through the headset. The headset was well grounded. I tried to continue the experiment, but this fellow still claimed that he was being shocked. He had made up his mind that I was going to shock him and would not believe otherwise. As a result, his data had to be discarded.

Other demand characteristics come from subtle cues that the participant picks up during the experiment. To minimize such cues, experimenters attempt to standardize all experimental procedures. An experimenter usually reads instructions, for example, from a written copy, so that all participants will at least have the same verbal demand characteristics. In some experiments, however, even the way the experimenter reads the instructions can affect the participant's performance. In one experiment, two sets of tape-recorded instructions were made by experimenters who were biased toward opposite experimental outcomes (Adair & Epstein, 1968). The experimenters found significant differences between the performances of those hearing different tapes. Although the experimenters read the same instructions, the subtle differences in their voices apparently produced results consistent with their biases.

Even animals seem to be influenced by subtle cues given by the experimenter. In one of the more famous experiments on experimenter bias, student experimenters trained rats to run a maze (Rosenthal & Fode, 1973). Some of the experimenters were told that their rats had been specially bred to be bright, fast learners; the others were told that their rats had been bred to be dull, slow learners. The supposedly bright rats learned to run the maze in fewer trials, even though they were in fact littermates of the supposedly dull rats. The usual reason given for this result is that the student experimenters must have treated the rats differently, playing with the "bright" rats more and handling

them so that they became less fearful of being manipulated. However, other investigators have claimed that the results might be due to student experimenters' cheating with their data (Barber & Silver, 1968). Whatever the reason, experimenter bias was reflected in the outcome of the experiment.

Though my presentation of the concept of demand characteristics makes it sound pretty ominous, it may be less of a problem than I have suggested. Investigators (Weber & Cook, 1972) have reported finding little evidence that experimental participants typically try to confirm what they believe is the experimenter's hypothesis, which they have deduced from cues in the experiment. Instead, these investigators claim that participants try to put their best foot forward; that is, they try to appear competent, normal, and likable. The participants' concern with how they will be judged is far more important than their concern about fulfilling the experimenter's expectancies or confirming the hypothesis.

T. X. Barber (1976), in a book dealing with the pitfalls in human research, reports that many experiments claiming to demonstrate demand characteristics are themselves seriously weakened by other design flaws. He believes that much of the research supporting the concept has been poorly done. However, just because the research may be flawed, we cannot necessarily conclude that demand characteristics can be ignored as a potential problem in our experiments. Anything that we can do to minimize their potential effects should be done to improve our experiments.

Responses of Participants to Demand Characteristics

If participants do detect the demand characteristics in an experiment, how might they respond?

Cooperative participants. After human participants determine in their own minds what the demand characteristics of the experiment are, they react according to their attitude toward the experiment (Adair, 1973). Most people tend to be *cooperative* and try to fulfill the perceived demands of the experimenter. Some cooperate to an astounding degree. In one experiment testing cooperativeness, the experimenter gave a participant a stack of 2000 sheets of paper and asked him to compute the 224 addition problems on each page. Although this task was obviously impossible, the individual continued to add for five and one-half hours, at which point the experimenter gave up! In a second experiment, the experimenter instructed participants to tear up each sheet into at least 32 pieces after completing the additions. Again, they persisted in the task for several hours without appearing hostile.

To see how this desire to cooperate might be behind a participant's response to demand characteristics, consider the following experiment on group pressure: A person is brought into a room with six other people. The group is given some problems, asking the group to judge which of two lines is longer. The first few problems are easy, and everybody agrees. Then two lines are presented, and our participant is sure that the top line is longer, but everybody else says the

bottom line is longer. After a long pause, the participant finally agrees that the bottom line is longer. What happened in this experiment? The experimenter designed the experiment to find out whether group pressure can cause someone to make an obviously incorrect response. The other participants in the room were confederates or stooges trained by the experimenter to lie on the appropriate trial. Because the real participant gave in to the group pressure, the experimenter feels that the hypothesis has been confirmed. But let's read the mind of our participant[5] and see what really happened: "Well, here's another pair of lines. The top line is definitely longer. What a dumb experiment this is! Why waste our time having us do such an obviously easy task? And why are we doing it as a group? The experimenter must be trying to see if we can influence each other. Sure enough, everybody else is saying the bottom line is longer. They couldn't possibly really think that. Let's see, I could either give in to these shills and agree or hold my ground. I want to do a good job so I can get out of here. Besides, I'm sure that a group of people can get someone to change his or her mind, so I might as well agree. Besides, the experimenter seems like a nice person and I don't want to mess up the experiment."

If our mind reading is correct, our experimenter's conclusion was wrong. The participant, who is only trying to be cooperative, can cooperate us into drawing an incorrect conclusion! In fact, by the 1970s it became apparent that participants in conformity studies such as the one just described were often highly suspicious, ranging from 50% to 90% indicating suspiciousness (Glinski, Glinski, & Slatin, 1970). However, the effect of suspiciousness on behavior appears to be negligible. In other words, there is little difference between the behavior of suspicious and naive participants (Kimmel, 1996), and where there are effects, the participants tend toward making themselves look good rather than reacting negatively toward the experimenter.

Defensive participants. Some participants are less concerned with making the experimenter look good than with making themselves look good; let's call them *defensive* participants. These individuals search for demand characteristics in the same way that cooperative participants do, but they use them differently. Usually participants trying to perform as well as possible are an asset to an experiment. But, in some experiments, particularly attitude-assessment experiments, such persons can cause problems.

Suppose that we are investigating the difference in the way Hispanics and Anglos view gender-role behavior in children. We post one sign-up sheet requesting volunteers who have Spanish surnames and speak Spanish as a first language and a second sheet requesting Anglos who meet neither of these criteria. Now we show each volunteer pictures of children in traditional gender roles (such as girls playing with dolls) and in nontraditional gender roles (such as boys playing with dolls). We then ask the participants to rate the acceptability of each behavior. Suppose that more Hispanics than Anglos report that they find the nontraditional behaviors acceptable. We might conclude that Hispanics are

[5] See, psychologists do have mystical powers.

more liberal than Anglos. On the other hand, another interpretation is possible. The members of each group are aware that they were selected on the basis of ethnic origin. Suppose that the Hispanics were more concerned with upholding the pride of their ethnic group than the Anglos were. In this case, they might have bent over backward to keep from looking like socially unacceptable chauvinists. In other words, they appropriately perceived the demand characteristics of the experiment and attempted to defend their ethnic group.

In an actual experiment that demonstrated the defensive participant's reaction to demand characteristics, experimenters asked participants to tap a key with their right and then their left index finger (Rosenberg, 1969). Tapping rates are usually faster for the preferred finger, but one group was told that graduate students at Yale and Michigan had been found to tap the key at similar rates with each finger. A second group was not given this information. The difference between tapping rates for the two fingers was significantly smaller for the first group. Again the participants perceived the not-so-subtle demand characteristics of the experiment and tried to make themselves look as good as possible.

Noncooperative participants. Some participants are neither cooperative nor defensive but downright *noncooperative!* The result of such behavior has been picturesquely called the "screw-you-effect" (Masling, 1966). The noncooperative individual attempts to determine the demand characteristics of an experiment and then behave in such a way as to contradict the experimenter's hypothesis. Such people act out of any number of motives. They may be participating to fulfill a course requirement and resent being coerced. Or they may be opposed to the whole idea of studying human behavior scientifically. Or perhaps they simply do not like the experimenter. Whatever the reason, such individuals can be a real nuisance in an experiment. One way to eliminate noncooperative participants is to set some minimal standard of performance so that you may exclude any participant's data that fall below this standard. You should determine this standard before the experiment and note it when the experiment is reported.

Even this procedure will not eliminate the data of all noncooperative participants, however. Sometimes the best we can do is attempt to give the participants a positive impression of our experiment and hope that they will be cooperative.

How to Minimize Demand Characteristics

Although we cannot completely eliminate demand characteristics from an experiment, every attempt should be made to minimize those demand characteristics that might become confounding variables by differentially affecting the levels of the independent variable. It is important to know whether a change in behavior is due to the experimenter's manipulation of the independent variable or to the participant's perceived demand characteristics. Confounding caused by demand characteristics can be minimized in several ways.

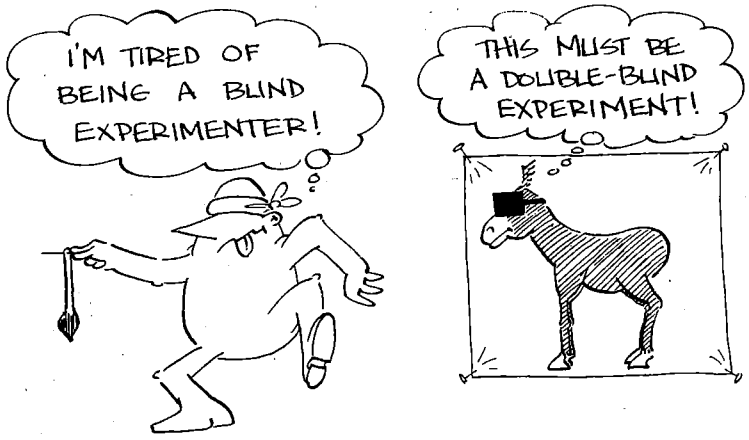
Automation. Demand characteristics can be controlled by *automating* as much of the experiment as possible. We have already discussed the use of tape-recorded instructions as one type of automation. Experimenters are often poor at reading instructions anyway, particularly after reading them aloud 20 or 120 times. You can also ask a person who is unaware of the expected outcome of the experiment to record the instructions if you want to minimize experimenter bias caused by voice inflections.

I have also used videotaped instructions in some of my own experiments or used computer presentations containing both audio and video. In this case if experimental trials involve complicated sequences of events, sample trials can be presented at a slow enough rate for participants to follow, thereby eliminating the need for the experimenter to go back and explain earlier portions of the instructions.

In some laboratories, computers are used to play all or part of the experimenter's role in an experiment. Some investigators program the computer so that the participants never see a human experimenter. The participant shows up at the appointed time. A sign instructs the individual to be seated at the computer terminal and to press a button. The computer then displays the instructions. The individual indicates his or her understanding of the instructions, and the experiment proceeds. The general idea behind this approach is that if participants are not the passive automatons we once thought they were, we can turn experimenters into automatons instead. However, some researchers object to this procedure on the grounds that the artificiality of the situation not only causes participants to feel dehumanized but also decreases the generalizability of the results. This procedure also requires that participants be able to read and understand the instructions, which makes it unsuitable for some participants, such as children and rats (and college sophomores?).

Blind and double blind. A second way of minimizing demand characteristics transmitted by the experimenter is to keep the experimenter from knowing the level of the independent variable being presented. Typically, participants are unaware of the level being presented to them. For this reason such experiments are usually called **blind experiments.** However, it is sometimes important that neither the participant nor the experimenter be aware of the manipulations in an experiment. For example, I once did an experiment to determine whether it was possible to "feel" colors with the fingers. Participants were blindfolded and given three cards, two red and one blue. On each trial they were required to put the two cards that were alike in one stack and the one that was different in another. I was concerned that I might unintentionally signal them when they were correct by changing my breathing rate, coughing, or grunting when they had the cards correctly arranged. Some of my ESP-believing friends even suggested that I might be sending ESP messages when they were correct! To avoid such signaling, I sat behind a screen so that I could not observe the participants. I was thus "blind" to the color they were feeling. In fact, this procedure is sometimes called **double blind,** because neither the participant nor the experimenter is aware of

which level of the independent variable the participant is exposed to.[6] Psychopharmacologists, who investigate the effects of drugs on behavior, often do research using a double-blind design. Suppose that you, a researcher, want to know whether a drug called Crowzac, which has just been developed, cures people of being depressed whenever they saw crows. You realize that there may be a problem if you just give the drug to one group of patients and then try to determine whether their depression has been relieved. The depression might get better solely because of the patients' expectation that the drug will help them. It is also possible that if you are evaluating the patients' depression, you will see a phantom improvement because you expect it. To protect against the effects of patient or experimenter expectations, you could use a second, no drug level of the independent variable with another group—a control group. You would have to treat this control group in exactly the same way you treat the drug group except for actually giving them the drug. You would probably decide to give the control group placebos in place of the drug.



Giving a **placebo** involves administering a nonactive substance in the same manner that the active drug is administered. If the drug is taken in pill form, the placebo might be just a sugar pill, or if it is an injection, a saline solution might be the placebo. Even in research on marijuana, placebo cigarettes have been produced that taste like marijuana but do not contain the active ingredient. The purpose of the placebo is to produce a double-blind design; both the experimenter and the participants are blind to whether any individual is receiving the drug or the placebo.

Sometimes it is difficult or impossible to keep participants and the experimenter from knowing the level of the independent variable to which participants are being exposed. If you were an investigator interested in how lighting conditions in an assembly plant affect worker productivity, you might keep one group of workers under existing conditions and put a second group under

[6] One of my reviewers points out that this procedure then made me double color blind!

increased illumination. Now, the workers are obviously aware of the lighting conditions as soon as they step into the room, and nothing you do would prevent that. I use this example because this was the initial experiment done in the 1920s from which the term *Hawthorne effect* came. Hawthorne was the name of the Western Electric Company plant where the experiment was done. The reported outcome was that productivity increased by the same amount for both groups regardless of the lighting conditions. The **Hawthorne effect,** then, refers to a change in behavior that is due simply to the experimenter's paying attention to the participants rather than to the effects of the independent variable. The overall finding from this research was that over a 5-year period as changes were made in working conditions such as lighting, rest pauses, and number of hours worked, productivity kept increasing regardless of which condition the workers were under (Roethlisberger, 1977).

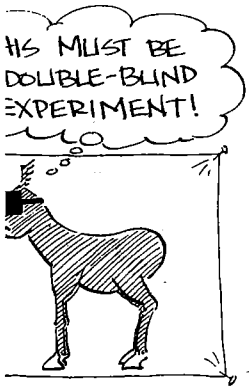
The original interpretation of this finding was that the workers' morale kept improving as continuing attention was paid to them during each change in conditions. However, Mac Parsons (1974) reviewed the original research and discovered that over the course of the experiment the workers were given increased access to feedback about their daily productivity. This feedback, combined with changing the way they were paid, could have led to the increased productivity. His claim was that the workers had simply increased their output as a function of increasing reinforcement. So the Hawthorne effect as it is typically interpreted may not have actually caused the results observed at the Hawthorne plant. Nevertheless, it is certainly possible for an experimental manipulation to cause a change in behavior independent of what that manipulation was. So as an experimenter you must attempt to minimize these effects and the effects of participants' knowing to which level of the independent variable they are exposed. If these effects cannot be completely eliminated, at least you should be alert to the possible confounding they might cause.

Multiple experimenters. A third way to deal with experimenter-caused demand characteristics is to use *multiple experimenters.* In this case you do not control the experimenter variable but allow it to vary by using random assignment of the available experimenters to the various levels of the independent variable. Such a procedure increases the generality of your result and decreases the chances that a single, blatantly biased experimenter will influence the outcome.

Are Demand Characteristics a Problem in Your Experiment?

Even when you have attempted to minimize demand characteristics, they can creep into your experiment. Here are some procedures for detecting them.

Postexperiment questioning. For a number of years after the revolution against subjective verbal reports, experimenters seldom questioned participants about their impressions after the experiment. Fortunately, many experimenters now routinely seek this information. Such information can be valuable not only for uncovering demand characteristics but also for suggesting new hypotheses that can later be tested in a formal experiment.



de me double color blind!

Postexperiment questioning can take many forms, from the experimenter's asking an offhand question to a well-structured written questionnaire. If you want to be sure of uncovering demand characteristics, you should plan your questions ahead of time.

In planning your questions, make sure that they do not have demand characteristics built into them. For example, in the group-pressure experiment discussed earlier, a biased question would be "You weren't aware that the other participants weren't real participants, were you?" The question itself demands that the respondent say no. If respondents say yes, they are admitting that they were not the naive, cooperative people they had agreed to be. They also put themselves in the position of telling the experimenter that the experiment was a waste of time because their data cannot be used.

You should also plan your questions so that they go from general, open-ended questions to specific, probing questions. For example, in one experiment designed to determine whether humans could be conditioned without being aware of it, participants were asked to talk about any topic they wished and to continue until asked to stop (Krasner, 1958). Whenever they said a plural noun, the experimenter nodded, said "Good" or "Uh-huh," and was generally reinforcing. As participants continued to talk, they used plural nouns more frequently. As evidence that the participants were unaware of the conditioning, the experimenters asked the postexperiment question "Did you notice that the experimenter was doing anything peculiar as you talked?" Most reported that they had not. Other investigators, not convinced by this experiment, did a similar experiment but followed the original question with progressively more specific questions, such as "Did you notice that the experimenter would respond when you said certain words?" Although the participants had trouble verbalizing it, most of them were aware that "the experimenter was happier when I talked about certain things, like listing parts to cars." Those who mentioned this awareness were the same ones who had shown the effect of conditioning. Thus, to determine whether participants are influenced by demand characteristics, we should ask questions related to specific demand characteristics and more general questions.

Nonexperiments. Another way to determine whether demand characteristics could have affected the experimental outcome is to compare a **nonexperiment control group** with an experimental group (Adair, 1973). The nonexperiment control group is not exposed to manipulation of the independent variable at all. Members are simply told about the experiment, given the instructions, shown any apparatus, and then asked to describe how they think they would perform if put into that situation. If their prediction is similar to the outcome of the experimental group, they may have been able to detect demand characteristics. These characteristics, rather than the independent variable, could have caused the outcome of the experiment. If their prediction is different from the experimental outcome, demand characteristics probably did not cause the observed behavior.

For example, Mitchell and Richman (1980) were suspicious of a finding that supported a "quasi-pictorial" memory representation of mental images. In a typical experiment, participants are asked to memorize a visual stimulus, generate a mental image of it, and then "scan" from one point on the image to another. The usual finding is that there is a direct linear relationship between scan time and physical distance on the stimulus. Mitchell and Richman thought that demand characteristics were possible with this procedure, so they conducted a nonexperiment in which participants were simply asked to predict their scan times. These individuals produced scatterplots that were indistinguishable from those found in the previous experimental work. The researchers could not rule out the possibility that the original findings could also have been caused by demand characteristics.

Simulation control groups. Although asking participants who have not been in the actual experiment how they would have behaved may give you some idea of demand characteristics, it really doesn't tell you how they would actually behave and may mislead you. For example, for a long time people have been curious about whether folks who are hypnotized can be made to perform antisocial acts or to injure themselves. In 1939, Rowland reported an experiment in which hypnotized participants were told that a large diamondback rattlesnake was a rope and were asked to pick it up. One of the two participants immediately attempted to do this, striking his hand on the invisible glass separating him from the poisonous snake. However, 41 of 42 nonhypnotized control participants refused when asked to do the same thing. The original finding was again replicated in 1952 by Young (as cited by Kihlstrom, 1995); seven of eight hypnotized participants tried to pick up the snake, which was behind an invisible glass, and were also willing to throw a glass of nitric acid at a research assistant, who was also behind glass. Do these results indicate that hypnotized people are willing to carry out antisocial and harmful actions?

In 1965, Orne and Evans devised a new procedure, the simulation control group, to investigate this topic. A **simulation control group** is exposed to the experimental situation but without a critical manipulation of the independent variable. In this case, an experimental group of highly hypnotizable participants was hypnotized and asked to pick up a snake called an Australian two-step, because that is as far as you get after it bites you! All participants complied, and they were also willing to remove a coin from a beaker of nitric acid and even throw the acid at one of the experimenters, again protected behind glass. However, both a group of participants not susceptible to hypnosis but asked to simulate being hypnotized and a group of nonhypnotized participants also complied without exception. Were these folks really so insensitive that they were willing to hurt themselves and the experimenter? Of course not. When interviewed after the experiment they said they felt perfectly safe in the experiment. They knew that the experimenter would not allow them to be harmed; safety was one of the demand characteristics of the experiment and they knew it. The simulation control group in this case was needed to fully understand how the demand characteristics rather than hypnosis might have dictated behavior.

ALTERNATIVE EXPERIMENTER–PARTICIPANT RELATIONSHIPS

In the beginning of this chapter was the naive participant. And the naive participant was pleasing in the sight of the experimenter. But not all naive participants are good; most are not even naive. So far we have been considering ways of keeping participants as naive as possible, or at least discovering when they cannot be considered naive. We have another alternative, however. We can give in to the fact that participants are not naive and make use of their problem-solving ability.

Deception and Role Playing

One way to use this problem-solving ability, is to give participants false cues so that their interpretation of the demand characteristics is incorrect. This procedure of **deception,** defined as concealing or camouflaging the real purpose of an experiment, is a controversial topic in psychology, for both moral and practical reasons.

Deception is widely used in psychology, particularly in some areas of social psychology. Indeed, some areas of social psychology could not be investigated experimentally without deception. For example, suppose that you are interested in determining the conditions that cause bystanders to give aid to someone who is apparently in trouble. It would obviously be quite inefficient to stand around on a street corner until someone is actually in trouble. Instead you would probably contrive a situation in which a confederate[7] fakes being in trouble and you then observe bystander behavior. Of course, then you have deceived the bystander, but how could you do the experiment otherwise? Deception runs the gamut from the famous and notorious experiment by Stanley Milgram (1963), who deceived participants into believing they were administering dangerous and perhaps fatal electrical shocks to other participants, to fairly innocuous experiments in cognitive psychology. For example, in an experiment on incidental learning, the participants may be asked to look at a list of words and rate them on some dimension such as emotionality. Then at the end of the experiment they are given a memory test and asked to recall the words from the original list. In some respects they have been deceived because they were never informed that they should memorize the words. But it would have been impossible to study incidental learning if they had been informed; the learning would have been purposeful, not incidental.

Whether the use of deception is increasing or decreasing is debatable. As shown by several surveys, it certainly did increase in the 1970s and into the 1980s (Gross & Flemming, 1982). However, more recent surveys indicate that its use has leveled off or even declined (Nicks, Korn, & Mainieri, 1997). It certainly appears to be the case that the kind of deception used has changed in that there are now few studies that blatantly mislead participants and more that simply withhold relevant information.

[7] No, not a rebel soldier! In psychology this is what we call people who are trained to help the experimenter by acting in a prescribed way during an experiment.

The argument for using deception goes something like this: Although it is generally wrong to lie, we are justified in temporarily misleading participants because we are contributing to the advancement of science. And as we have discussed, in some areas of psychology it would be impossible to answer many of the most important questions without using deception. Besides, we debrief our participants after the experiment is over and are perfectly honest at that point, thereby wiping out most of the effects of the deception.

The argument against the use of deception goes something like this: You can use a term like "misleading" if you wish, but it is just a nice way of saying "lying." There is enough dishonesty in the world without being dishonest in the name of science. How many of these "scientifically justifiable" experiments have caused great leaps in science? Not many! We can devise alternative ways of doing many of the experiments anyway, such as having participants role-play. It is naive to think that debriefing participants at the end of the experiment wipes out all effects of the deception. As a practical matter there are two additional problems: deception increases future participants' suspiciousness and reduces trust in psychologists, giving the profession a bad name. Deception in psychology is not worth the costs and should be eliminated (Ortmann & Hertwig, 1997).

Research on these first two points has been done (Kimmel, 1996), and it suggests that the effects of participant suspiciousness on research performance are negligible. In addition, this research indicates that deceived participants do not become resentful about having been fooled by researchers and deception does not negatively influence their perceptions about psychology or their attitudes about science in general. For example, Christensen (1988) reviewed studies that assessed research participants' reactions to deception experiments and found that people who participated in deception experiments report that they did not mind being deceived, enjoyed the experience more (than those participating in nondeception experiments), received more educational benefit from it, and did not perceive that their privacy was invaded. In addition, surveys have consistently shown that most individuals in the general population do not have serious objections to deception used in research.

Role playing has been suggested as an alternative procedure to deception. Is it equally effective? Some experimenters have tried to use both deception and role playing under the same conditions and then compared the results. In *role playing* the experimenter asks participants to imagine that they are in a particular situation and to respond as they think they would in a similar real-world situation. If you are interested in bargaining behavior, for example, you might ask one individual to imagine that he is a labor leader, another to pretend that she is the president of a company, and a third to act like an arbitrator. You then proceed under the assumption that their responses in some way resemble those of people in the same real-world situation.

Unfortunately, although some experiments do report equivalent results from deception and role playing (Greenberg, 1967), many others do not (Orne, 1970). It is also difficult to specify the conditions under which similar results can be expected from the two methods. In many respects role playing experiments are much like the simulation control mentioned in the previous

section. Perhaps role playing simply reflects the demand characteristics of the experiment, rather than allowing us to predict what behavior would occur in a real-world situation.

The American Psychological Association says the following about deception in its *Ethical Principles of Psychologists and Code of Conduct* (APA, 2002):

> 8.07 Deception in Research
> (a) Psychologists do not conduct a study involving deception unless they have determined that the use of deceptive techniques is justified by the study's prospective scientific, educational, or applied value and that equally effective alternative procedures that do not use deception are not feasible.
> (b) Psychologists do not deceive prospective participants about research that is reasonably expected to cause pain or severe emotional distress.
> (c) Psychologists explain any deception that is an integral feature of the design and conduct of an experiment to participants as early as is feasible, preferably at the conclusion of their participation, but no later than at the conclusion of data collection, and permit participants to withdraw their data.

As fledgling psychologists you should take these rules seriously, and if you are considering the use of deception in one of your experiments, you should carefully weigh its costs and benefits.

Naturalistic Observation

I already mentioned this final alternative to the standard experimenter–participant relationship in Chapter 1. *Naturalistic observation* depends on the experimenter's being an unobtrusive observer. Rather than having participants pretend to be in a bargaining role, for example, the experimenter might go to an actual bargaining situation and observe behavior. We have already discussed the problems associated with this method. Experimenters usually have little control over the variables in the situation. They often have to wait for them to occur naturally, and even then they cannot control potential confounding variables or draw causal conclusions from the correlational data.

In this section we have examined the problems of treating participants as naive, uncontaminated observers. At the least, we should be aware of the problem-solving nature of participants and design our experiments so that the effects of their attempts to solve problems can be evaluated. Where possible, these attempts should work for us rather than against us.

I will give the APA the final word (paraphrased) on the investigator's responsibilities for treatment of human participants. Here are the principles the investigator would do well to follow (APA, 2002):

1. Evaluate the ethical acceptability of the experiment.
2. Determine whether participants are at risk.
3. Retain responsibility for ethical procedures.
4. Disclose risks to participants and obtain informed consent.
5. Determine whether deception is justified and necessary.