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Research Methods

A social psychologist, like any other scientist, utilizes a specific set of procedures to examine the phenomena of interest to him. This is otherwise known as the **scientific method**. The scientific method is a way of understanding the natural world. It is a set of assumptions and procedures that guide the way we gather data, and they specify the conditions under which we can trust the data that are obtained. For example, one principle of the scientific method is standardization. It stipulates that, in an experiment, all aspects of the experiment are the same for all experimental conditions except the levels of the independent variables. Doing this helps the researcher make the assertion that, if she obtains differences on the dependent variable between experimental conditions, then those must have been caused by the differences in the independent variable between the conditions, because each group was exposed to the same procedures and stimuli in all other respects. In this chapter, we discuss further how social psychologists conduct their research. Of course, this is by no means meant to be an exhaustive review, and those interested in a more complete discussion are advised to consult other detailed sources (e.g., Aronson, Brewer, & Carlsmith, 1985; Aronson, Ellsworth, Carlsmith, & Gonzales, 1990; Reis & Judd, 2000).

TYPES OF STUDIES

Descriptive

One of the first questions researchers need to ask is what type of data they are seeking. Do we merely want to ask questions of the subjects? Do we merely want to describe people, or a person, or an interaction? This basic type of research is termed *descriptive research* and encompasses very simple methods such as surveys, or case studies, or naturalistic observation (whereby a subject is observed but is unaware of being observed; for example, people-watching in a mall). It is important to note that these studies do not manipulate variables, and they don't allow us to make any cause–effect statements about behavior. But these types of studies are good places to get ideas for experiments.

Correlations

Another source for experiment ideas is correlational research. Remember that a correlation is the naturally occurring relationship between any two variables. For example, there is a strong positive correlation between physical violence and ice cream sales. Huh? Does that mean that eating a lot of ice cream makes you more likely to hit someone? Or is it the other way around?

Hitting someone makes you crave a nice bowl of rocky road ice cream? Both of those seem unlikely. Perhaps a third explanation would make more sense. What do the two have in common? They both increase in the summer. So, perhaps it is the case that this third variable, summer, causes an increase in both, and in so doing, causes an artificial correlation between ice cream sales and rates of physical violence. This illustrates one of the problems with correlational research: the so-called third variable problem whereby two variables are correlated only because they are linked to a third variable that is the reason for elevations in those two variables (Brewer, 2000). Correlations tell us that two variables are related but not *how* they are related. You may have heard the axiom "Correlation does not equal causation." That is unfortunate, because more often than not, social psychologists are seeking to discover the causes of behavior in a given situation. If the goal of science in general is to explain and predict observed phenomena, then it would be best to be able to know what tends to reliably cause a particular behavior (or thought, or feeling) to occur. So, just like descriptive research, correlational studies are good points for researchers to get ideas for experiments that will help reveal causation.

Experiments

The great majority of research in social psychology comes in the form of experiments. There is a good reason for that. Experiments are the only way that we can establish cause and effect relationships between variables. Experiments allow researchers to examine the influence of one variable (or several) on the individual, and by holding other variables constant, we can establish the causal influence (if any) of that variable on behavior. We are seeking to discover if there is a causal effect of the independent variable(s) (IV; the variables the experimenter manipulates) on the dependent variable(s) (DV; the variables the experimenter measures).

In the smallest, simplest type of experiment design, a 2×2, there are two independent variables, with two levels of each variable. This forms four experimental conditions. Subjects are *randomly selected* (everyone in the population of interest has an equal chance of being selected for the experiment) and then *randomly assigned* (each subject has an equal chance of being assigned to any of the experiment conditions) to one of the four experimental conditions. Remember, an IV is something that the experimenter manipulates. We cannot manipulate aspects of the subject, such as their gender, religion, socioeconomic status. Those are termed *subject variables*. Suppose our variables are mood and comfort. For mood, we will assign people to either experience happiness or anger. For comfort, we will assign people to either a high comfort or low comfort condition. We write this design like this: it is a 2 (mood: happy vs. anger) $\times$ 2 (comfort: high vs. low) between-subjects design. The between-subjects designation says that each subject is exposed to one level of each of the variables. In a within-subjects design, all the subjects are exposed to all levels of all variables. So, if we hold all variables constant, and only vary those we want to vary (the IVs), then to the extent that we find differences between the experimental groups on their answers on the dependent variable (in this example, let's say the DV is expectations for future success on a task), we can say with some confidence that the different levels of the IV are the cause of the differences on the DV.

THEORY AND HYPOTHESES

Good research must be based on a theory. The goal of the research is to develop data that speak to the theory either in terms of

support or no support. A theory is an integrated set of principles that explains and predicts some phenomenon. In psychology, we can't say that our data "prove" a theory (as one can in some other sciences), because we are dealing with humans and humans are messy. There will always be outliers in any experiment, testing any theory. We never get to 100% perfect results all the time, but we can get very close. We set very high standards for accepting that there is a true cause and effect relationship between two variables. This is the statistical likelihood that the results are due to chance. We say that we will only consider a finding a reliable and causal factor in changing the DV when there is less than a 5% chance that that change is due to random error. The hypotheses we derive from the theory are testable predictions about what we believe will happen in a given situation, with certain factors present. For example, given the theory of cognitive dissonance (Festinger, 1957), we might make a prediction about what a person will do when they say one thing that is incompatible with a behavior that they just performed. If we find evidence that the prediction was not supported, and assuming we didn't have any major flaws in our design, method, or statistical power, we would say that the theory is thus not supported. If the theory continues to bring no supportive data, it will be abandoned in favor of a different, ideally more parsimonious (accounts for the most data with the fewest assumptions) theory. This is what we refer to as the "self-correcting nature of science."

DOING EXPERIMENTAL RESEARCH: FURTHER CONSIDERATIONS

Suppose you are ready to start recruiting your subjects for your experiment. First, how many subjects do you need? Researchers can get a fairly exact number (N) for their study from a computer statistical program. A rough rule of thumb I used to use was to strive for about 20 per experiment condition for between-subjects designs. Too few subjects, and one will not have the statistical power to find an effect if it is there (Type II error—incorrectly believing there is no effect when there is one). On the other hand, if you have too many subjects, tiny effects may look significant erroneously (Type I error—incorrectly believing there is a significant finding when there is none in reality).

Second, how and who do we recruit? Ideally we would like to have our results generalize to the entire world, but that isn't possible because of cross-cultural differences. So we (researchers in the United States) will restrict our population to people in the United States.[1] How do we find our sample (the group of people from the population who do the experiment)? We randomly select them from the population. This means that everyone in the population has an equal chance to be selected for the experiment. This, as you might guess, is an ideal that no one ever reaches. First, not everyone in the United States is reachable. Some are homeless, some are institutionalized, some are ill, some live off the grid, and so on. Ideally we would like the sample to be a small

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[1]But even a country can have important regional differences that can affect our ability to generalize our results, depending on the nature of our research. For example, research on aggression has shown significant differences between people in the northern United States and those in the southern United States in their acceptance and even expectation of physical violence as a response to threats to one's (or their family's) honor (Cohen & Nisbett, 1994).

representation of the population. So, according to that, I would want to have equal proportions of subjects as in the population according to their race, gender, religion, education level, age, and so on. You can guess that this is very labor-intensive, expensive, and nearly impossible to accomplish. So, instead, what we do is recruit subjects from introductory psychology classes on campus. Are college students a representative sample of the entire U.S. population? No, but they are the closest we can practically get. There are legitimate criticisms of this approach (Sears, 1986). However, psychologists generally have made the case that the differences between the college sophomore and other adults in the population are not significant enough to warrant concern.

Third, once we have our sample, we need to randomly assign (each person has an equal chance of being in any of the experiment conditions) each person to an experimental condition. Doing this ensures an equal distribution of people in each condition. Based on probability, we get a roughly equal proportion of people who are tired, hungry, excited, confused, and any other idiosyncrasies, distributed in each condition. In so doing, we have experiment conditions made of equal groups. So when they are exposed to the IV, the differences we see on the DV (if any) are due to the IV and not to individual differences between people.

Fourth, how do researchers overcome the problem of the artificiality of the lab? This is a big problem that can interfere with the potential generalizability of the research findings to the population. An experiment is worthless if it only explains behavior that happens in the lab room of the researcher. We want our lab results to be able to predict behavior in the real world. There are two ways researchers have tried to solve this issue. First is something called mundane realism. This is where the researcher tries to make the lab room physically look like a real-world setting. The idea is that if the room looks like the real world, subjects will forget the artificiality of the situation and will be more likely to behave as they would in the real world. The problem with this approach is that it is expensive, labor-intensive, and impractical, given that most researchers share lab space. An alternate solution is that researchers strive for psychological realism. The idea here is to have the IV be especially strong, such that it is psychologically and emotionally involving. The stronger the IV punch, the more the subject will react naturally. This does seem to work, and it is good advice for all researchers. One of the reasons most experiments fail is that their IVs are too weak. But if our IVs are strong enough, and the data still fail to support the hypotheses, we will know it is not the strong IVs but something else (e.g., too few subjects, poor measures, reactive topic, etc.).

INTRODUCTION TO READING 2.1

Aronson et al. (1990)

Nearly all psychology experiments, by necessity, have to employ a bit of deception in order for the experiment to work. That is, participants need to be kept in the dark about the specific purpose of the experiment, so that such knowledge doesn't influence their behavior and thus render worthless any data obtained from the participants. The deception takes the form of a "cover story," a sort of vague explanation of the purpose of the study (e.g., a study on racial prejudice might be called a study of social issues). The degree of deception also varies from mild (such as the kind I just mentioned) to strong, as in the case of Milgram's (1963) infamous obedience experiments, where subjects really believed they were hurting (or killing) another man in the next room. At the end of experiments, researchers should debrief the subjects, telling them about the true purpose of the study and why they needed to be deceived. Different researchers have different opinions on how to debrief. For the more mild types of deception, some experimenters may elect to hand out a short debriefing sheet to the participants at the end of the

study. These sheets explain the study and purpose of deception, as well as provide contact information and even some references for those interested in learning more about the topic.

With experiments that involve more deception, it is important to do a face-to-face debriefing. This part of the experiment has a number of considerations that are detailed in the chapter you are about to read. Debriefing should be done a certain way, with careful attention to make sure that the subject doesn't feel worse (e.g., gullible for believing your cover story) than they did when they started the experiment. The debriefing is an opportunity for the subject to learn more about the study and also, importantly, an opportunity for the experimenter to learn from the subject about how the experiment appears to the subject. In my view, this chapter, written by a prominent social psychologist, should be required reading for all social psychologists as they learn research methods. I remember it having a big impact on me after I read it, and I hope you enjoy it too!

Reading 2.1

The Postexperimental Interview

**Elliot Aronson, Phoebe C. Ellsworth,
J. Merrill Carlsmith, and Marti Hope Gonzales**

The experiment does not end when the data have been collected. The experimenter will want to determine the subjects' reactions to the procedure and to provide them with a full explanation of the experiment. The postexperimental interview is not an unimportant "add-on"; rather, it provides the investigator with an invaluable opportunity to find out what the experiment meant to the individual subjects. It is an opportunity for the subjects to comment freely about how the experiment struck them, why they responded as they did, the alternatives they considered, and all other facets of their individual responses. This is the time for us to determine whether the subjects interpreted their experience as we intended. More important, the postexperimental interview provides the experimenter with an opportunity to fulfill an obligation to the subject: to explain all aspects of the procedure fully,

This is the key point of this chapter: The post-experimental interview (aka "debriefing") is an extremely important tool when constructing your experiment and a very useful tool that one should strive to always include as part of your experiment. In experiments involving deception, it is crucial that the experimenter do a post-experimental interview.

A main reason for debriefing is to find out if participants were suspicious or interpreted the procedures, questionnaires, or purpose of the experiment differently or in a way that might bias their responses.

to explore the meaning of the experience for the subject and the experimenter, and to discuss the scientific importance of the results.

If any deception has been employed, the experimenter now can verify that the subject believed the version of events presented in the cover story, or discover whether the subject had some doubts. If the subject *did* entertain any suspicion, the experimenter can systematically probe for further information needed to judge whether the suspicion was specific enough and accurate enough to raise questions about the validity of the data collected from that subject.

Whether or not deception is used, the experimenter should give the subject a full explanation of the experiment and make certain that the subject completely understands the purposes and the procedures before leaving the laboratory. If the experiment has involved any disquieting events, the experimenter can explain why those events were essential. If any deception has been involved, it is almost always best if the subject is informed of the deception and the reasons why it was necessary.[1]

Experimenters have a responsibility to do a professional, ethical, and thorough post-experimental debriefing.

It is impossible to exaggerate the importance of the postexperimental interview. A poorly conducted debriefing can be the most distressing part of the whole experiment, making the subject feel like an object or—worse yet—like a fool. Accordingly, the postexperimental interview should never be approached lightly.

Some researchers have suggested that caring, sensitive experimenters are born and not made—as if any potentially good experimenter has an intuitive sense of what constitutes a considerate debriefing. Moreover, they suggest, if potential experimenters do not know the difference between a glib and cavalier debriefing and one that is respectful and caring, then they shouldn't be experimenters in the first place. We disagree. We believe that this aspect of the

Aronson and colleagues rightly point out the importance of learning how to do a proper debriefing, and that this is a skill that can be learned and taught.

experiment is as much a skill as is each of the preceding phases, and that a great deal of effort should go into teaching these skills. The art and skill of debriefing should be as important a part of research training as learning to find or create settings, to manipulate the independent variable, to measure the dependent variable, and to analyze the data. Therefore, we have devoted this chapter to a discussion of the "whys" and "how tos" of conducting the postexperimental interview.

The two major purposes of the interview are closely interwoven. For the remainder of this chapter we will focus our attention on debriefing following an experiment involving deception. Many of these remarks are equally applicable to the experiment with no deception, but the issues are *especially* critical when deception is involved.

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[1]Even the standard of full and honest disclosure is only a guideline, not an absolute rule. In some cases, such disclosures may create feelings of confusion, anxiety, or persistent self-doubt that may be more dangerous for the subject than ignorance of the whole truth. In research with children, for example, the child may not be able to understand the explanation and may be made to feel confused and uncertain about an event that might have seemed vaguely interesting but not particularly important. Or the child may remember only that the experimenter lied. One good way to deal with this problem is to explain the experiment to a parent who knows the child well and so is in a better position to decide what to say about the experiment.

Other dangers may arise in experiments involving adult subjects. If a personality test is administered, for example, it may often be unwise to reveal the subjects' scores to them or even to disclose the purpose of the test. Personality tests may have a reliability that suffices for large group experiments, but that should not be trusted for individual assessments. Even in experiments in which most subjects do receive a complete explanation, it may not be the best thing for some individuals. If a subject completely misunderstands the instructions and behaves inappropriately throughout the experiment, it may be very difficult to explain the experiment without making the subject feel like an idiot. These, and others like them, are delicate cases; the experimenter must always be sensitive to peculiarities of the procedures or of individual subjects that might raise questions about the advisability of complete debriefing. Like all other general rules in this book, the rule of full and honest disclosure has exceptions.

CONDUCTING THE POSTEXPERIMENTAL INTERVIEW

If the experiment has involved deception, the experimenter must (1) probe gently to determine the precise nature of any suspicions the subject may have and (2) explain the deception in a considerate and gradual manner. In practice, these two aims are mutually consistent and can be realized simultaneously by the same general procedure.

Probing for Suspicion

In probing for suspicion, it is important to utilize a series of questions, introduced gradually. Why the need to move gradually? Why not simply ask if the subject suspected deception on the part of the experimenter? For a variety of reasons, subjects may be unresponsive to direct questions. First, a person who *did* guess the hypothesis might hesitate to admit it, out of a misplaced desire to spare the experimenter. Second, regardless of their feelings for the experimenter, most people are reluctant to admit that they can be fooled easily. Consequently, a subject who is suddenly told that deception was involved may imply that he or she suspected it all along. Thus, an abrupt procedure might fail to reveal some of the truly suspicious subjects, while falsely exaggerating the number of apparently suspicious subjects. As a result, the experimenter may be led to make inappropriate changes or to abandon a perfectly viable procedure. Moreover, abruptly stating that deception has been used is a harsh technique that could add unnecessarily to the subject's discomfort and elicit justifiable anger.

The best way to begin a postexperimental interview is to ask if the subject has any questions. If the subject has none, the experimenter should ask if the entire experiment was perfectly clear in its overall purpose and if all aspects of the procedure made sense. The subject can then be told that people react to things in different ways and that the experimenter would find it helpful to hear about the subject's feelings about and reactions to the experiment, the reasons for the subject's responses, and so on. Then, the experimenter should ask specifically whether the subject found any aspect of the procedure odd, confusing, or disturbing. Such a discussion may take a considerable length of time

By this point in the interview, the subject is likely to have revealed any doubts or suspicions. Moreover, the experimenter should have all the information needed to discover whether the subject misunderstood the directions or failed to share the experimenter's assumptions about the meaning of the treatment. If no suspicions have been voiced, the experimenter can continue: "Do you think there may have been more to the experiment than meets the eye?" This question is almost a dead giveaway. Even a previously unsuspicious subject will probably begin to suspect that the experimenter was concealing something. In our experience, many subjects will take this opportunity to say that they did feel that the experiment, as described, appeared too simple, or too complex, or not ideally designed to test the hypothesis, or something. This is desirable. Whether or not the subjects really were suspicious, this question allows them to indicate that they are not completely naive; it gives them a chance to see themselves as less gullible than they otherwise might. The experimenter should immediately ask them to say some more about their suspicions, to elaborate on their questions about the procedure. The experimenter can then ask how these questions might have affected their behavior. From the subjects' answers to these questions, the experimenter can judge the extent to which their suspicions are likely to have affected their responses.

Debriefing is a gradual process, involving many questions, designed to allow the participant to feel comfortable in revealing their thoughts about the purpose of the experiment, and any suspicions they may have had about aspects of the experiment.

There is no set time allotment for debriefings. However, the experimenter should allow sufficient time to do a relaxed, thorough interview at the end of each experiment session. So, for example, the experiment could take 20 minutes, and the experimenter would then allow for another 10–25 minutes for debriefing (the exact timing of each session and debriefing can be better estimated during pilot-testing of the experiment).

Key question. Allows participants—even if they were not suspicious—to "save face" and not feel naïve or gullible about being deceived by the experimenter.

This is a fairly conservative technique; it will tend to overestimate the number of suspicious subjects, since some subjects may not arrive at any accurate suspicion until they have been exposed to a hint that deception may have been involved and have been forced by direct questioning to consider the nature of that deception. The criteria for excluding subjects' data should be rigid and should be set down before the experiment begins; an appropriate time is between the pilot subjects and the first "real" subject. And, of course, the decision to eliminate any particular subject from the data analysis should be made without knowledge of how that subject responded on the important measures.

Incidentally, it should be apparent that one implication of these recommendations is that subjects should be debriefed individually, even when two or more subjects have participated in the experiment. In the first place, it is difficult, if not impossible, to make accurate assessments of two subjects' reactions to the experiment if they are interviewed simultaneously. If one subject voices a suspicion, there is strong social pressure on the other to concur. Together, the two subjects are likely to arrive at a common interpretation of the experiment, which may not reflect what either of them felt at the time. Thus debriefing subjects in groups defeats the experimenter's purpose of making precise determinations of the degree of suspicion felt by each subject. In addition, this procedure defeats another primary purpose of the debriefing: the protection of the subject's feelings of competence through gradual revelation of the hypothesis. If two subjects are debriefed together, the less suspicious one may feel gullible and inferior when the other first voices any suspicions. The one who is slower to perceive the gist of the experimenter's gradual revelation of the purpose of the study may feel stupid and naive when the other understands it more quickly. The experimenter's remarks to the effect that most subjects typically believe the cover story will be vitiated if the subject sees another person whose perceptions differed. This kind of experience in group debriefing can make a subject feel foolish, and we have more than once heard students who have been debriefed in this way (not in our experiments) complain that "the debriefing was the worst part of the experiment."

Revealing Deception

When deception has been employed, debriefing in and of itself can cause subjects considerable embarrassment. Most people do not enjoy learning that they have been duped. Thus, even subjects who are perfectly convinced that the experimenter obtained no satisfaction deceiving them may *still* feel foolish, simply because they have been successfully deceived. For that reason, extreme care should be used in revealing the specifics of the deceptive techniques employed.

Once the experimenter has a full understanding of the subject's perception of the experiment, the debriefing process should be continued. Thus, the experimenter might say something like this: "You are on the right track; we were interested in some problems that we couldn't discuss with you in advance. One of our major concerns in this study is. . . ." The experimenter should continue by describing the problem being studied, specifying the reasons for its importance and explaining clearly exactly how the subject was deceived and why the deception was necessary. Further, the experimenter can reduce subjects' embarrassment by explaining that a great deal of time and effort went into constructing a situation that would be credible to everyone. By doing so, the experimenter assures the subjects that being duped or taken in does not in any way reflect on their perspicacity; rather, it is an indication that

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Margin notes

When determining the criteria under which one will discard a participant's responses, it is important to have that done before running the experiment (OK to do during pilot testing).

Absolutely always debrief participants individually. Even if they were run in groups. The debriefing process is a conversation between the experimenter and each unique, particular participant. If one tried to debrief pairs or groups, their responses could influence the responses of others in the group, and the information the experimenter obtained would be worthless.

This is important to remember. When deception is used, it is important to do a post-experiment interview. But it is important to do it CORRECTLY, or else it is very easy for the participant to feel naïve, gullible, or embarrassed for believing the deceptive cover story about the experiment.

When deception is a part of the experiment, it is important during debriefing to clearly communicate to the participant that deception was necessary and that it is important that all participants believe the deception, or else the experiment wouldn't work. So the experimenter must stress that the participant shouldn't feel gullible because our job is to make sure ALL people believe the deception.

the experimenter had done his or her job right, and that the cover story was a credible one. The experimenter should include this information in the debriefing so that the subjects will realize that they were taken in by the effectiveness of the *situation* and *not* because of any gullibility or naivete of their own. Moreover, before terminating the experimental session, the experimenter should be certain that the subject fully understands all this.

A similar procedure is in order when the experimental treatments induce the subjects to behave in a "negative" manner—for example, to conform in the Asch experiment. Clearly, if the experiment is designed to produce this kind of behavior, and it is a good experiment, most subjects will be manifesting the unflattering behavior at least some of the time. The experimenter should point this out to each subject, stressing the fact that the person is not extreme in this direction; rather, the experimental operations must have been extremely powerful, since they induced the same kind of behavior from most of the people who served as subjects.

There is little doubt about the goal of the debriefing process. Most investigators would agree with Herbert Kelman's (1968, p. 222) recommendation that "in general, the principle that a subject ought not to leave the laboratory with greater anxiety or lower self-esteem than he came in with is a good one to follow." How can we be sure that this goal has been achieved? It is sometimes difficult to tell whether the subject still feels uncomfortable after the debriefing. It is conceivable that some subjects might feel that they must act like "good sports" or help the experimenter save face and so may pretend to be in good spirits while remaining in inner turmoil. The experimenter should not be taken in by such pretenses but rather should go out of his or her way to make it easy for the subject to express any misgivings about the experiment. A good way of getting a subject to reveal any lingering disturbances or uncertainty about the experiment is to solicit suggestions for improving the experiment. If subjects still feel uneasy about their behavior in the experiment, or uncertain of any of the things the experimenter said, it is invariably easier for them to attribute these doubts to some hypothetical future subject than to admit personal concern. For example, consider an experiment in which the treatment involves creating a feeling of temporary low self-esteem in the subject by administering a fake personality test and then revealing the "results" that portray the subject as a weak, unattractive person. At the end of the session, the experimenter will of course assure the subject that the negative personality description was made up long before the subject ever took the test, that the same description is given to all subjects in the negative condition, and that the subject would have been given the same feedback no matter what responses were made on the test. At this point, the subject might ask, "But what happens if you get a person who just happens to really correspond to the description you gave?" This might be the hypothetical question it appears to be. But as psychologists, we know that it is possible that this subject is expressing some personal anxiety and, although realizing that the test was a fake, is still concerned about the possible accuracy of the description. The experimenter should take such a statement as a cue for extra tact and extra time spent reassuring the subject. In describing how the hypothetical future subject might be dealt with, the experimenter might point out that the negative personality description was comprised of vague generalities that sound plausible and applicable to all subjects. The experimenter might even read over some of the items, pointing out that *everyone* believes that a person "feels shy in new situations" or "sometimes hurts people without meaning to" or whatever the negative statements might be. If the subject has really been expressing her own worries, the extra information should be reassuring, and she will have been spared the necessity of admitting personal concern openly.

This is another key important point: The experimenter must strive to do everything he/she can to make sure that the participant leaves the experiment feeling no worse than when they started the experiment. For example, in experiments where a negative mood is induced in some subjects, those persons may be asked to rate how funny they find various comics at the end of the study, in order to put them in a good mood.

The timing of the debriefing is frequently a relevant factor in the experimenter's attempt to prevent the subject from experiencing unpleasant aftereffects. Some experimenters prefer to wait until after all subjects have completed their participation in the experiment before informing any of them of the true nature of the research. The explanation of the experiment is often accomplished en masse through the use of a printed communication. This procedure has certain economic and methodological advantages, that is, it saves time and makes it impossible for a subject to reveal the experimenter's description of the experiment to any future subject. There may be some experimental circumstances in which delayed mass debriefing can be employed without ill effects. However, we do not recommend this kind of shortcut debriefing when there is any chance that a deception or its revelation might be painful for the subject. Moreover , even if no discomfort is likely to ensue, other aspects of an experiment may make it wise to debrief the subject immediately after the session. In a typical study of opinion change, for example, the subject's opinion may have changed because, in the experiment, a particular point of view was attributed to a prestigious person. It would be a breach of ethics for the experimenter to allow this changed opinion to affect the subject's behavior after leaving the laboratory. Clearly, the sooner the subject is debriefed, the better.

In addition, in many experimental situations, the subjects are students, and, as mentioned previously, one of the reasons for students to volunteer (and a major rationale for using them) is the educational value of the experience. If the experimenter personally provides a clear and detailed explanation of the experiment as soon as it ends, allows the subjects to ask questions, and spends time clearing up any ambiguities that may remain, the subject receives maximum educational benefit from the experience.

Our student experimenters have sometimes complained to us that it is impossible to provide the sort of careful, sensitive debriefing we recommend because the subjects aren't interested in listening to it. It is hard to establish rapport with a person who is gathering up books, mumbling monosyllabic answers, and glancing at the clock every five seconds. Unfortunately, not many subjects expect a full explanation of the experiment or a serious concern about their own reactions, perhaps because they so rarely get them. Thus, it is important to tell the subject at the outset that you are going to sit down and discuss the experiment in detail, and that this is one of the most important parts of the experiment. It is a good idea to say how long it will take. And in scheduling the experimental sessions make sure you include enough time for the postexperimental interview. If you schedule the subject for one hour and the experiment itself takes 55 minutes, you cannot possibly conduct a thorough interview, nor can you expect the subject to be motivated to cooperate.

We have placed heavy emphasis on the obligations of the experimenter to provide immediate feedback to the subject. These obligations are real and comprise the strongest arguments for such feedback. But it is important to point out that by omitting the lengthy interview with the subject which we have recommended, the experimenter is deprived of an important heuristic experience. Nothing is a richer potential source of information about the strengths and weaknesses of an experiment than subjects' responses to detailed debriefing.

It is conceivable that in some circumstances, the experimenter may feel that the debriefing should not be complete. For example, the underlying theory, the conceptual variables, or the overall design of the experiment might be so complex that it is difficult and unnecessary to convey a complete picture of it to the subjects. In such cases the complete picture may be so intricate as to merely confuse the subjects about those aspects of the experiment that have

I agree with Aronson et al.—it is always advisable to do the debriefing with each participant immediately at the end of each experiment session (rather than wait to debrief all participants at once after all participants have been run in the study).

The thorough debriefing is an extremely important aspect of any experiment and essential to those involving deception. The responses of the participants can yield vital information that will serve to enhance the experiment.

most relevance to them. In these circumstances the experimenter might simplify the explanation, presenting only those aspects of the experiment which are easily explained and which are most pertinent to the subjects' own experience. It would be a mistake, however, to hold back aspects of the deception; to do so would violate the subjects' trust in the one part of the experiment where they have a right to expect perfect honesty.

How can we tell if the debriefing has been successful? Experimenters frequently ask the subjects to write down their reactions to the experiment after the debriefing is over. To some extent this procedure is designed to be a check on the effectiveness of the debriefing and to assess the fully informed subject's perceptions of the ethics of the experiment. It is difficult to know how much confidence to place in subjects' responses to such questions, since some people may be reluctant to criticize the study or to indicate discomfort, but at least on this superficial level, the results of postexperimental checks are very encouraging. For example, recall that Bibb Latane and Judith Rodin (1969) ran a study in which subjects overheard a woman in the next room fall down and cry out in pain. Although the subjects didn't realize it, the experimenter's true concern was with the question of how people would respond to the woman's distress. In most of the conditions, a majority of subjects did not respond at all—not even to the extent of calling out to ask whether the woman needed help. After the subjects had been debriefed and informed of the true purpose of the experiment, the experimenters asked them to fill out an anonymous questionnaire about their reactions to the experiment. Ninety percent of the subjects said that they had understood the true purpose of the experiment and that the use of deception was necessary to achieve this purpose. When asked about their personal reactions to the experiment and the *ethics* (as opposed to the necessity) of the deception, all of the subjects said that they would be willing to participate in similar experiments in the future and that the use of deception was justified. In addition, most of the subjects found the experiment interesting and stated that they were glad to have taken part. Although we cannot be sure that all subjects were telling the whole truth, it is unlikely that there was a great deal of unstated resentment. Moreover, it seems safe to assume that after the debriefing, most of the subjects felt that the experience had been worthwhile.

Enlisting the Subject's Aid

Because of demand characteristics inherent in conducting a direct assessment of subjects' perceptions and opinions about an experiment, it is often useful for the experimenter and instructive for the subject to make use of a more subtle measure: to enlist the subject's aid in improving the experiment. That is, before ending the debriefing, the experimenter can ask the subject for any suggestions about ways to improve the experimental procedure to make it more powerful, more credible, and more interesting for future subjects. This is the best way we know of for finding out about any of the negative aspects of the experiment. As we have pointed out repeatedly (see Chapter 9, for example), experimental subjects tend to be cooperative. In the worst circumstances, this may prevent them from admitting that the procedure caused them anguish, that the experiment had no meaning for them, or that it meant something other than what the experimenter thought it should mean. By specifically appealing to the subjects to help improve the experiment, the investigator can turn this cooperativeness to the advantage of the research and to the benefit of future subjects. In response to a genuine appeal, subjects may be only too pleased to cooperate by

Subjects love to be "good subjects" and do anything to help the experimenter. One great way they can do this is by giving their thoughts on how to improve the experiment.

At the end of debriefing, the experimenter needs to make clear to the participant the importance of not telling other potential participants about the details of the experiment (because if they knew about it before participating, any data obtained from them would be worthless).

criticizing the experiment. These criticisms often lead to improvement and are an indispensable aid to the experimenter, especially in the pilot stages of the research. In addition, this procedure often allows the subjects sufficient latitude to admit that they were (or still are) upset by the procedure or the deception; if this should occur, the experimenter knows that further efforts must be made to bring the subjects to a full understanding of the reasons for the procedure and an acceptance of their own responses to it.

Finally, the experimenter tries to convince the subjects *'not to reveal anything* about the experiment. This is a serious problem, because even if only a few subjects have been tipped off, the results can be invalid. Moreover, it is sobering to reflect on the fact that it is almost impossible to screen out sophisticated subjects in advance. It is not easy to successfully swear all subjects to secrecy; often, the subjects are drawn from a single class or school, and there is consequently a strong likelihood that they have friends who might subsequently volunteer for the experiment. These friends are almost certain to press former subjects for information. The experimenter can conduct the experiment in a manner designed to minimize intersubject communication by recruiting subjects from a variety of contexts, by running the whole study in as short a time as possible, by checking to make sure that later subjects are not room-mates of early subjects (if a subject's roommate wants to participate, sign that person up for the next hour, so there will be no time for communication), and so on. In addition, the experimenter should attempt to forestall communication after the session, by graphically describing the waste of time and effort which result from including people who have prior knowledge about the procedure or the hypothesis of the experiment. In addition, the experimenter should provide a vivid account of the damage that can be done to the scientific enterprise by using data from such subjects. The experimenter should explain that because such information usually spreads rapidly, telling even one person might result in several subjects whose performance is either unusable or misleading.

This is an important point: If the experimenter is professional, and serious, and is honest and sincere in dealing with the participant, then the participant will be more likely to reciprocate by respecting the experimenter's admonition to not divulge experiment details to others (until after the whole study has concluded).

The experimenter who has been sincere and honest in dealing with the subject during the postexperimental debriefing session can be reasonably confident that few subjects will break faith. To check on this, Aronson (1966) enlisted the aid of three undergraduates, each of whom approached three acquaintances who had recently participated in one of his experiments. The confederates explained that they had signed up for the same experiment, had noticed the friend's name on the sign-up sheet, and wondered what the experiment was all about. The experimenter had previously assured these confederates that their friends would remain anonymous. The results were encouraging. In spite of considerable urging, begging, and cajoling on the part of the confederates, none of the former subjects revealed the true purpose of the experiment; two of them went as far as providing the confederates with a replay of the cover story, but nothing else. Of course, not *all* experiments have given us such reason for optimism; some experimenters have found considerable leakage (e.g., Farrow, Lohss, Farrow, & Taub, 1975; Horka & Farrow, 1970; Lichtenstein, 1970; Walsh & Stillman, 1974). Differences in subjects' willingness to divulge information about an experiment could be a function of the nature of the deception employed; specifics of the experiment; when, where or by whom they were approached and asked for information; or the content, process, and degree of rapport established during the postexperimental session.

It will be easier for subjects to withstand pressure from curious friends if the experimenter gives them something to say. In urging the subjects to keep the true purpose of the experiment a secret, the experimenter can give examples of what they might say if asked about the experiment. For example, the experimenter can suggest that the task or some

other superficial aspect of the procedure be described. Having something explicit to say spares the subjects the embarrassment of having to cut off friends with a prim, "I'd prefer not to discuss it," and also spares them the awkwardness of having to invent an innocuous description of the experiment.

What if the subject has been forewarned before entering the experimental room? That is, suppose that a subject *does* find out about the experiment from a friend who has participated previously. The new subject probably will not reveal this to the experimenter before the experiment, for fear of being disqualified from earning credit, money, points, love, or whatever incentive may have enticed the subject into the laboratory.[2] Moreover, if not prodded, the subject is unlikely to confess this after the experiment, because of reluctance to implicate the friend who, after all, broke a promise to the experimenter. Yet if the experimenter is unable to elicit this information, the results may be extremely misleading and the statement that no subjects were suspicious or sophisticated may be a serious error.

How can we be sure? Once again, the experimenter attempts to enlist the subject's cooperativeness, as well as the good will, which, it is to be hoped, has been built up during the postexperimental interview. First, as described above, the subject should be told clearly and forcefully the serious problems presented to science (and this particular research) if, unwittingly, the experimenter were to report erroneous data. The experimenter can then explain that although subjects are cautioned not to discuss the experiment, occasionally a former subject will reveal something by mistake. At this point, the experimenter can appeal to the subject to help out by mentioning now if she or he heard even a little about the experiment. The subject should, of course, be assured that the experimenter is uninterested in finding out *how* or *from whom* the information was transmitted. In the face of such a plea, few forewarned subjects will remain silent. We cannot overemphasize the importance of this kind of procedure as a safeguard against the artifactual confirmation of an erroneous hypothesis due to the misplaced cooperativeness of the subject. A truly cooperative subject will probably cooperate with the experimenter in this regard also and will respond to a direct plea from the experimenter.

DEBRIEFING FOLLOWING FALSE FEEDBACK TO SUBJECTS

Many of the suggestions we made earlier are aimed at helping the experimenter to achieve the goal of restoring the subjects' self-esteem and sense of well-being and of making the experiment a worthwhile experience for them. The experimenter should not assume, however, that following all these suggestions in preparing a standardized debriefing speech will automatically ensure success in returning the subjects to their pre-experimental state. Some experiments include false feedback to the subjects about their own abilities or performance. Such experiments require special care and caution in the postexperimental interview to ensure that the subjects not only understand that deception was involved but that they are also reassured

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[2]Indeed, some researchers have taken advantage of subjects' tendencies to deceive experimenters about their knowledge. For example, David McMillen and James Austin (1971) were interested in the effects of having told a lie on people's willingness to help. When subjects were waiting to begin, a confederate entered the waiting room and told them about the alleged experiment. Fortunately for McMillen and Austin, and perhaps unfortunately for many other experimenters, 100 percent of the subjects—who were informed not only that the experiment involved taking a multiple-choice test, but also that most of the correct answers were "B"—lied to the experimenter and said they had heard nothing about the study!

Margin notes:

If the experimenter discovers this, he/she should discard this subject's session, and note for the record the reason why this subject's session was discarded.

A major component of psychological research is to educate participants (during debriefing) about the theory, design, hypotheses, and how they can find out more information about the experiment topic area. One efficient way to do this is to prepare a written debriefing with journal references and contact information for the experimenter. This sheet is given to all participants as they leave the session.

As discussed earlier, post-experimental debriefing is essential in studies that involve deception. If that deception also entailed telling the subject some negative evaluative information about themselves (e.g., that they did poorly on an IQ test), one has an ethical responsibility to make sure that the subject understands that this information was false, and that they understand WHY it was important to deceive them into believing the false information.

that what the experimenter said to them about their own performance is devoid of information value. Some research suggests that a simple debriefing may be inadequate to erase the beliefs about ability that are induced by false feedback during an experiment (Ross, Lepper, & Hubbard, 1975). Recall from Chapter 9 that these investigators gave subjects a series of notes, some ostensibly written by people who had actually attempted suicide, others by people simulating suicide notes. The subjects' task was to guess which of the notes were real and which were simulated. Independent of actual performance, some subjects were told that they had done very well (24 out of 25 correct). Other subjects were told that they had done poorly (10 out of 25 correct). During a full debriefing, all subjects were told clearly that the feedback they had received was unrelated to their performance and had been determined randomly before the experiment began. Nevertheless, when later asked a series of questions about whether they thought they were really good at discriminating real from fake suicide notes, subjects still showed residual effects of the experimental treatments. That is, subjects who were told that they were successful at the task (even though it was later clearly explained that they were not in fact successful) still believed that they would be more successful in the future than did control subjects. Similarly, subjects who were told that they had done badly still expected to do badly in the future, even after a full debriefing.

The mechanisms underlying this "perseverance" phenomenon are still not well understood, and speculation about them goes beyond our purpose here. Nevertheless, the demonstration is an important one for any experimenter who gives subjects false feedback about performance, personality, or anything else. Fortunately, Lee Ross and his colleagues were also able to show that a fuller debriefing, one that explicitly discusses the perseverance process, can successfully undo the results of the experimental treatment. A thorough understanding of this "process debriefing," as they term it, is important for any experimenter. Basically, it consists of not only indicating that the feedback was incorrect and discussing the reasons for this but also providing a full explanation of the tendency for people to maintain their distorted perceptions about their abilities at the task, even after the original information that created the perceptions has been discredited.

When false feedback is related not to subjects' performance on a specific experimental task but rather to more enduring personality characteristics, "undeceiving" subjects may be especially difficult. Elaine Walster and her colleagues (1967) found evidence that debriefing was not always immediately effective and that some kinds of subjects may behave as though they still believe the manipulation, even after a longer delay. Apparently, the situation these researchers used to induce low self-esteem in their subjects triggered all sorts of thoughts and memories that activated other *real* feelings of low self-esteem in some subjects, and these feelings could not easily be removed by debriefing. The subjects seemed to realize that the experimenter had been lying in suggesting that they were inferior people; nevertheless, their own reactivated feelings of inferiority led them to feel that the experimenter's characterization had unwittingly hit on the truth. It was as though the subjects said to themselves, "I know he didn't mean it, but it's true anyway." This kind of resistant residual effect presents a very serious problem, especially since at the present time we have no reliable means of identifying in advance the subjects for whom regular debriefing procedures are likely to be ineffective.

Each subject is unique, and it is important for the experimenter to be attuned to things the subject says in the post-experimental interview that would call for the experimenter to add new questions or follow a new line of questioning, in order to make sure each subject is as informed, feeling as good as possible, and educated about the purpose and rationale for deception in the experiment.

At the very least, the experimenter should make every effort to determine the needs of each individual subject and should try to tailor the debriefing session to meet these needs. The information provided should be redundant, especially for any individualized feedback the experimenter might have given the subject on the basis of false personality tests and the like.

The technique of gradually inducing the subject to recognize and describe the deception is probably one of the most effective means of ensuring that the subject fully understands it. A subject who is able to state the truth about an experiment is probably more likely to understand the truth than is one who simply hears it from the experimenter. If the debriefing session lasts longer than the experimenter expected, the next-scheduled subject should be canceled, so that the subject being debriefed doesn't leave with any remaining anxiety or confusion. Finally, the experimenter might do well to test the subject's understanding of the experiment in general and the treatment as it was applied in particular.

As we have pointed out repeatedly in this text, the experimental psychologist who concludes that research involving deception is the only valid method for elucidating the questions under study faces difficult ethical questions. Surely the quality and efficacy of the procedures used to explain the research and experimental procedures to the subject are indispensable for the justification of the use of such techniques. Research on this critical aspect of the entire experimental procedure is a welcome addition to our knowledge of how to carry it out most successfully and humanely.

POST-ARTICLE DISCUSSION

Often, when new experimenters are designing their studies, they may focus more on the design, materials, and procedure of the study and less on what happens when the data have been collected. The experiment is done, right? No. As you just read, the researcher has an ethical duty to inform the subject about the true purpose of the study and to explain why the experiment was conducted as it was. Ideally, this should be done face to face, with the experimenter taking time to answer any questions the subject has in a sensitive, clear manner. Debriefing should be an educational experience for the subject, and subjects can learn more about how research in psychology is designed and conducted and why some procedures need to be followed (e.g., deception).

I think one of the things about the Aronson et al. chapter that makes it so important is that it makes the point that debriefing is essential, it should be taken seriously, and researchers have an ethical obligation to learn how to do debriefings thoroughly and with sensitivity to their subjects. Researchers must make sure they are attentive to any concerns subjects may have. The researcher is in a power position and has to be sensitive to the subjects' position so that the subjects don't feel intimidated to not ask questions or to give false or socially desirable answers (when subjects give politically correct or other answers they think you want to hear but that may not reflect the subject's true position). Finally, the experimenter can learn a lot from the subject, in terms of ways to improve the experiment and how the experiment procedures are influencing subjects (in intended or unintended ways).

Even after having run several experiments during my undergraduate and graduate training, I remember reading this during my doctoral training and finding this chapter a revelation. I hope you enjoyed the chapter and have new insights about the ethical and scientific responsibilities that psychology researchers have when conducting research with human subjects.

THINGS TO THINK ABOUT

1. Do you think all social psychology experiment debriefing should be done face to face? Why or why not?

2. Some critics of social psychology experiments say that researchers should never deceive the subjects. Do you agree? Explain.

3. How long should a post-experiment interview (debriefing) last?

4. When debriefing, should you read a script to your subjects? Should you have them complete more questionnaires during the debriefing (e.g., to probe for suspicion)?

5. What can the experimenter do to ascertain whether the subject is in a worse state at the end of the experiment (compared to when they started), and, if so, how can the experimenter restore the subject's well-being or affective state?

INTRODUCTION TO READING 2.2
Dickerson et al. (1992)

This article is a bit different from the Aronson et al. chapter in that it doesn't specifically focus on research methods, but rather, it is an experiment showing how to induce cognitive dissonance in people and, in so doing, cause them to conserve their water usage. This paper is less of a discussion of ways to do research and more of an illustration of (1) a very clever methodology to (2) address a practical concern using (3) social psychological theory. As an example of a practical application of social psychological theory, cognitive dissonance theory was shown in a previous study to help increase condom use (Aronson, Fried, & Stone, 1991). Dickerson and her colleagues attempted in this experiment to apply the same principles to encourage water conservation.

The father of modern American social psychology, Kurt Lewin, famously said, "There is nothing so practical as a good theory." He was making the point that our research should inform us on how best to address real-world problems and make people's lives better. Science for science's sake has its place, but Lewin was more interested in finding ways for researchers to help solve daily problems in real life, as well as larger societal issues, such as poverty, prejudice, and justice. As I mentioned earlier, one of the features of the article you are about to read is that it addresses a real-world issue directly and (mini-spoiler) quite successfully! Finally, pay special attention to the creative method and the lengths to which the researchers go to obtain the data. Enjoy the article, and we will talk more afterward!

Reading 2.2

Using Cognitive Dissonance to Encourage Water Conservation[1]

CHRIS ANN DICKERSON

RUTH THIBODEAU, ELLIOT ARONSON,[2] AND DAYNA MILLER

In a field experiment on water conservation, we aroused dissonance in patrons of the campus recreation facility by making them feel hypocritical about their showering habits. Using a 2×2 factorial design, we manipulated subject's "mindfulness" that they had sometimes wasted water while showering, and then varied whether they made a "public commitment" urging other people to take shorter showers. The "hypocrisy" condition—in which subjects made the public commitment after being reminded of their past behavior—was expected to be dissonance-arousing, thereby motivating subjects to increase their efforts to conserve water. The results were consistent with this reasoning. Compared to controls, subjects in the hypocrisy condition took significantly shorter showers. Subjects who were merely reminded that they had wasted water, or who only made the public commitment, did not take shorter showers than control subjects. The findings have implications for using cognitive dissonance as means of changing behavior in applied settings, especially those in which people already support the desired goal, but their behavior is not consistent with those beliefs.

Policy makers frequently attempt to modify behavior in a community, often by instituting information-based persuasive campaigns. These appear in various forms including broadcast announcements, newspaper advertisements, signs, mailings, and flyers. In recent years, drought has prompted administrators at the University of California at Santa Cruz (UCSC) to launch a major campaign of just this sort. Campus newspapers contained advertisements from the Water Conservation Office; flyers were posted on public bulletin boards and appeared in mailboxes. Specifically, the UCSC program encouraged people to think of water as a valuable resource and to adopt conservation-oriented behaviors such as flushing toilets less often, stopping the flow whenever possible while brushing teeth or washing dishes, and taking shorter, more efficient showers.

Introduces the problem under investigation. Here it is a very applied (real-world, having real consequences in daily life) problem: water conservation. The issue: how best to design a persuasion message that is neither too weak nor too-heavy handed?

The effectiveness of these types of persuasive messages and information campaigns is not certain. One experiment (Aronson & O'Leary, 1983) found that prominent signs asking people to take shorter showers produced mixed results. Indeed, if the message is too heavy-handed, it can even create a backlash. For example, although some subjects in the Aronson and O'Leary study reduced their water use, others showed their annoyance by sabotaging the signs and taking inordinately *long* showers. Moreover, even if people are initially persuaded by signs or flyers that conservation is worthwhile, there is controversy regarding the potency of such straightforward, and sometimes "coercive," appeals. They can produce attitude change, but the effects are frequently short-lived (Aronson, 1980).

Similarly, even when messages praising the value of water conservation are successful in changing people's attitudes, there is no guarantee that new attitudes will translate into new behaviors. Social psychologists have long been aware that the link between attitudes and behavior is problematic (e.g., Wicker, 1969). Thus, simply persuading people that conservation is beneficial might not result in reduced consumption. For example, Bickman (1972) interviewed 500 people about their attitudes concerning responsibility for removing litter. Although 94% of the subjects expressed favorable attitudes toward removing litter, only 2% actually picked up litter that had been intentionally left outside of the experimental setting by the experimenter.

We reasoned that a more effective means of promoting water conservation on campus might involve dissonance-generated self-persuasion, rather than informational or coercive appeals to save water. The motivating influence of cognitive dissonance has been shown to promote changes in attitudes as well as behavior (Aronson, 1969, 1980; Brehm & Wicklund, 1976; Freedman, 1965). Dissonance-related techniques have been utilized successfully in a number of applied situations: for example, to improve weight loss (Axsom & Cooper, 1981), reduce snake phobia (Cooper, 1980; Cooper & Axsom, 1982), and as a component of programs designed to promote energy conservation (e.g., Gonzales, Aronson, & Costanzo, 1988). Moreover, Pallak and his colleagues have demonstrated that dissonance-related interventions can produce enduring behavior change. Longitudinal studies have shown that a public commitment manipulation can cause people to reduce their energy consumption for six months or more (Pallak, Cook, & Sullivan, 1980; Pallak & Cummings, 1976; Pallak, Sullivan, & Cook, 1976).

As formulated by Festinger (1957), dissonance theory proposes that when a person holds two cognitions that are psychologically inconsistent, the person will experience cognitive dissonance, an unpleasant drive state akin to hunger or thirst. Once dissonance is aroused, an individual is motivated to reduce it, primarily through attitudinal or behavioral changes designed to reestablish consistency. Soon after Festinger's initial conceptualization, Aronson (1960, 1968) proposed that dissonance theory makes its clearest predictions when expectancies about the self are involved—that is, when people have done something that violates their self-concepts. Most of us share certain general beliefs about ourselves: for example, that we are good, moral, competent individuals. Therefore, choosing to engage in a behavior that is at odds with these important beliefs about the self should produce dissonance.

Given the central role of the self-concept in dissonance arousal, Aronson (1980) has argued that dissonance-related persuasion is likely to be much more effective than straightforward persuasive appeals. In a typical persuasion situation, such as those involving informational campaigns, people change their opinions because they have been convinced by an external source to do so. An unfortunate feature of this type of attitude change is that it is often

impermanent. For example, if I change my attitude because I hear a persuasive argument supporting one stance, I am likely to change it again if I hear a better argument supporting another position. There is very little of myself invested in the attitude.

In contrast, dissonance-generated persuasion is highly involving because it entails a challenge to a person's self-concept. Dissonance would occur, for example, if I believed I was a moral person, and then found myself in the uncomfortable position of having done something I considered immoral. To reduce this dissonance, I would need to rethink, or "justify," my actions in order to make them more consistent with my self-concept-typically through changes in relevant attitudes or behaviors. This subtle form of self-persuasion is powerful because the individual's self-concept is directly engaged in the process of attitudinal or behavioral change (Aronson, 1980).

Perhaps the most dramatic demonstration of dissonance-related persuasion is evidenced in the counter-attitudinal advocacy paradigm (e.g., Cohen, 1962; Festinger & Carlsmith, 1959; Nel, Helmreich, & Aronson, 1969). In this procedure, subjects are induced, under conditions of high choice or low incentive, to persuade others to believe something that they themselves do not believe. These subjects subsequently come to believe their own rhetoric; that is, they reduce dissonance by persuading *themselves* that their counter attitudinal statements were, in fact, a reflection of their true beliefs.

The counter-attitudinal advocacy paradigm, by definition, requires that experimenters induce people to defend a position that they were initially against. This requirement posed a problem for our effort to harness the power of the technique to promote water conservation. Conservation is an example of an "apple-pie and motherhood" issue that everybody already believes in, even though not everyone practices. Recently, however, Aronson and his colleagues (see Aronson, in press) have developed a modified version of the procedure so that it can be used in pro-attitudinal situations. The new technique involves creating feelings of hypocrisy. This is accomplished by inducing subjects to encourage other people to perform certain worthwhile behaviors. Subjects are then reminded that, on occasion, their own behavior has not been consistent with those goals. Essentially, subjects are confronted with the realization that they do not always practice what they preach. This realization is expected to generate dissonance because being a hypocrite would be inconsistent with most people's self-concepts as persons of integrity. As a result, subjects should be motivated to reduce dissonance by behaving in a manner more consistent with their espoused attitudes.

Introduction of hypocrisy.

In an experiment on AIDS prevention, Aronson, Fried, and Stone (1991) explored the dissonance-arousing properties of this new procedure. Using a 2 × 2 factorial design, they induced feelings of hypocrisy regarding condom use. All subjects wrote pro-attitudinal speeches advocating condom use during all sexual encounters. Then, half the subjects simply rehearsed the arguments of the speech. The rest videotaped their prepared speeches, which they were going to be shown to high school students as part of an AIDS prevention program. Before taping their speeches, however, half the subjects were also reminded of the occasions when they had failed to use condoms in the past. Thus, all subjects believed that condom use was important, and all had composed a speech arguing that point. However, only those who both made a videotape and were reminded that they had engaged in unsafe sexual behavior were expected to feel hypocritical. These subjects were expected to reduce dissonance by strengthening their intentions to use condoms in the future. Aronson et al.'s (1991) results were consistent with this reasoning. Compared to subjects in the other conditions, those who

received the hypocrisy manipulation expressed significantly greater intentions to increase their use of condoms, relative to their past behavior.

The results of this experiment are provocative in suggesting that a "hypocrisy" manipulation can arouse dissonance. Moreover, a follow-up experiment was conducted (Stone, Aronson, Crain, Winslow, & Fried, 1992), using a behavioral measure rather than self-reported behavioral intentions. Specifically, in each of the above conditions, subjects were subsequently given an opportunity to purchase condoms at a huge discount. Fully 83% of the subjects in the hypocrisy condition purchased condoms; this was a significantly greater percentage than in each of the other three conditions.

Did subjects, in fact, increase their condom use as a result of the hypocrisy manipulation? Obviously, it is impossible to know for sure. After all, one cannot follow people into the bedroom to observe their condom-using behavior. However, one *can* follow people into the shower-room—at least at public physical education facilities. The present experiment explores the utility of the hypocrisy-induction procedure in a field setting, using water conservation as the target behavior. In a conceptual replication of Aronson et al. (1991), public commitment endorsing water conservation was crossed with feedback intended to make subjects aware that they had wasted water in the past. After acknowledging that they supported conservation efforts, half the subjects agreed to help persuade other people to conserve water. Additionally, half the subjects were reminded that they did not live up to their own standards, and had sometimes been wasteful. The condition in which subjects both committed publicly to encourage other people to conserve and were reminded that they had wasted water was designed to make subjects feel hypocritical. These subjects were expected to reduce dissonance by reducing their water use while showering.

METHOD

Overview of the Procedure

Female swimmers were recruited as they exited the pool area, on their way to the locker room. A female experimenter (Experimenter 1), posing as a member of a campus water conservation office, approached each potential subject and asked if she could spare a few moments to help with a water conservation project. Then, depending on the experimental condition, subjects either answered some questions, signed a flyer, or both. Subjects were thanked for their participation, and their interaction with the first experimenter was terminated. However, unbeknown to subjects, a second female experimenter (Experimenter 2) was waiting in the shower room where she unobtrusively timed the length of each subject's shower and noted whether subjects turned the water flow off while soaping up.

Experimental Design

Two factors were manipulated: subjects' "mindfulness" of their sometimes wasteful showering habits, and subjects' "commitment" to pro-conservation behaviors. This 2×2 factorial design yielded the following conditions: 1) mindful-plus-commitment (hypocrisy), 2) mindful-only, 3) commitment only, and 4) unmindful/no commitment (no-treatment control). Our primary dependent variable was actual water use, as reflected in the length of subjects' showers. As a rougher measure of subjects' intentions to conserve water, we also noted whether subjects turned the shower off while applying soap, shampoo, or conditioner.

A "conceptual replication" refers to an experiment that tests the same hypothesis as a previous experiment, but uses different methods.

Hypothesis.

You might ask yourself: "why did they specifically seek out female swimmers for the experiment?" Remember that the goal of the experiment is to examine how the independent variables influence a person's water conservation. We'd ideally like to get a measure of their true conservation behaviors without the person being aware of it (so that the responses are most likely to be genuine). So how does one get a true assessment of a subject's water use without their knowledge? Sneak into their houses and hide somewhere in their bathrooms? Well that is illegal, so no. But we COULD have a research assistant approach people who are about to engage in some water-related activity (e.g., people at a gym taking a shower) and measure their shower water consumption.

The experiment requires that this experimenter employ a fair amount of deception, and acting talents!

Subjects

Participants in the study were 80 female swimmers who used the showers after exercising in the campus pool. Females were selected for this study because we intended to gather data only in the women's locker room. We used swimmers because pretesting indicated that swimmers could most reliably be expected to shower and shampoo before leaving the recreational facilities. Although the majority of swimmers used shampoo and/or soap when showering (to remove chlorine from their hair and skin), those few who simply rinsed off under the shower were excluded from the study in order to reduce extraneous within-group variance. This exclusion was minimal and did not occur with differential frequency in any of the treatment conditions.

And another reason they used swimmers. ☺

This is a good point that illustrates how one needs to be very specific in what is measured, and who qualifies as a participant. Here, not all female swimmers' shower data are used because some don't shampoo, and some just rinse. We want everyone to be standardized: to do the same behavior.

Experimental Setting

The particular configuration of the shower room is crucial to the design of this field study. The swimming pool and women's locker room are part of the same complex, with direct access to the showers available from poolside. The shower room is a large open room, approximately 15' wide by 25' long, without separate shower stalls or curtains. There are 13 showerheads, spaced along the walls of the shower room, and there are usually a number of people showering at any given time during operating hours. Typically, at least two or three other women were using the shower room at the same time as the subject and Experimenter 2. Frequently, there were more than five other women in the shower. These circumstances made it very easy to collect the dependent measures without attracting attention or arousing suspicion. Furthermore, it ensured that Experimenter 2's presence was unlikely to have detectable influence on the subject's behavior.

Procedure

While en route from the pool to the shower room, subjects were approached individually by Experimenter 1, who introduced herself as a representative of the campus water conservation office. After asking the subject if she had a few moments to spare, Experimenter 1 asked the subject whether she was on her way to the shower, and whether she was in favor of water conservation. If subjects answered "yes" to these questions, Experimenter 1 consulted a randomization chart and then introduced the experimental manipulations.

There are different ways to randomly assign a subject to an experimental condition. You could flip a coin, or use a random number table commonly found in the back of statistics textbooks (and close your eyes and point to a location on the table, open your eyes, and use that number to tell you to which condition you should assign the participant). The authors did something similar to the random number table here.

In the mindful-only treatment, she asked subjects to respond verbally to a "survey" consisting of a brief set of questions, such as: 1) When showering, do you ALWAYS turn off the water while soaping up or shampooing? 2) When you take showers, do you ALWAYS make them as short as possible, or do you sometimes linger longer than necessary? 3) In your view, about how long does it take an average person to shower and shampoo, without wasting any water? 4) About how long is your average shower at the Field House? These questions were designed to remind subjects that they had sometimes wasted water while showering.

In the commitment-only treatment, the subject was simply asked to help out with campus conservation efforts by printing her name with a thick black marking pen on a flyer that read: "Please conserve water. Take shorter showers. Turn showers off while soaping up. IF I CAN DO IT, SO CAN YOU!" Experimenter l explained that the flyer would be attached to posters that were being created for distribution around campus, and that they were intended to encourage other members of the campus community to conserve water. While making this

request, Experimenter l drew subjects' attention to the large, colorful "sample" poster on display nearby, and mentioned that another poster was already in place outside of the women's locker room.

In the hypocrisy condition (mindful-plus-commitment), subjects first responded to the brief "mindfulness" survey, then signed the "commitment" flyer as outlined above.

The fourth condition served as a no-treatment control. In essence, the behavior of the subjects in this condition reflects a baseline response to the interventions instituted by the university in an effort to save water. Due to persisting drought conditions in California, UCSC had been quite actively promoting water conservation. Advertisements in the campus newspapers and flyers posted on public bulletin boards urged members of the campus community to reduce their water use. Most pertinent to this study, the university had posted a very large sign inside the actual shower room. The sign read: "Take Shorter Showers. Turn the Water Off While Soaping Up."

Experimenters

Both experimenters were female students. The actions of the two experimenters were carefully coordinated. Experimenter l stood near a large door way leading from the pool deck into the athletic facilities complex. From this vantage point, she was able to intercept all female swimmers who were leaving the pool to enter the locker room. Experimenter 2 sat sunbathing by the pool, near the back door to the woman's locker room. This was approximately 30 feet from Experimenter 1's position. As Experimenter l began her interaction with the subject, Experimenter 2 watched, and made sure she could identify the subject later to collect the dependent measures.

As Experimenter l approached a potential subject, she asked the subject if she was on her way to the showers, and next, whether she could spare a few moments to participate in a water conservation project. If the subject answered yes to both, Experimenter l casually scratched her own knee before continuing the interaction. The knee scratch was a signal to Experimenter 2, who quickly entered the back door of the locker room, and began showering while waiting for the subject. This process enabled Experimenter 2 to remain unaware regarding which manipulation Experimenter l had delivered to the subject.

Experimenter 2 was already in the shower room, showering, when the subject entered. Several precautions were taken to guarantee that Experimenter 2 would not influence the subject's behavior. First, as noted above, the setting was a large shower room, and there were frequently a number of women showering. This reduced the possibility that Experimenter 2's presence had any noticeable effect on subjects. Additionally, since Experimenter 2 was often in the shower room for 10 to 15 minutes, she always brought shampoo, conditioner, a shaving razor, and a comb into the shower. These were used as necessary to make her showering appear as natural as possible. Finally, Experimenter 2 always left the water running during her shower. This was to avoid any possibility of influencing subjects to turn their own faucet on and off.

Dependent Measures

Experimenter 2 wore a waterproof sports watch with stopwatch capacity, which she unobtrusively activated as soon as the subject turned on the shower. She also noted whether the subject turned off the shower while applying soap or shampoo. To assess water use accurately,

Margin notes (left column):

These help enhance the legitimacy of the cover story that the experimenter is a "water conservation officer."

So, the mindful manipulation is designed to remind the subjects that they sometimes do not conserve water, while the commitment manipulation is designed to have the subject publicly proclaim that they always conserve water. This discrepancy creates the hypocrisy and, therefore, the cognitive dissonance that needs to be resolved.

This is what one might call a "labor-intensive" experiment. One that involves having a research assistant take a shower (and casually observing the subject's water-conservation behavior) every time a new subject is taking a shower! That is a dedicated scientist!

the watch was stopped when the subject turned off the shower and was reactivated if the subject turned it back on to continue her shower.

RESULTS

Manipulation Checks

All subjects answered "yes" to the first question in the survey "Are you in favor of water conservation?"—thus indicating that their attitudes on this issue were positive. In the two conditions in which mindfulness was manipulated, subjects' answers to the brief set of questions confirmed that they were aware of their sometimes wasteful showering habits. That is, all subjects replied that: a) they did not always take the shortest possible showers; b) they sometimes lingered longer than necessary in the shower; and c) they did not always turn the shower off while soaping up or shampooing.

Shower Times

A two-way ANOV A was performed on subjects' shower times, measured in seconds (see Table I). No main effects for commitment or mindfulness were obtained, nor was the interaction of the two factors statistically significant, model $F(1,76) = 1.48$, $p < .26$. However, a planned comparison of mean shower times revealed a significant difference between the hypocrisy group ($M = 220.5$ sec) and the control group ($M = 301.8$ sec), $F(1,39) = 4.23$, $p <.05$. Means for the commitment-only ($M = 247. 7$) and mindfulness-only ($M = 248.3$) groups did not differ from each other, nor did either differ from the control or hypocrisy groups.

Turning Off the Shower

We also compared how often subjects in each condition turned off the shower while shampooing or soaping up. An overall chi square analysis yielded a marginally significant difference among all four groups on this dichotomous measure ($\chi^2 = 7.742$, $df = 3$, $p < .052$) (see Table 2). Next, a comparison of the hypocrisy and control groups revealed a significant difference in the expected direction, with hypocrisy subjects turning off the shower more often than control subjects ($\chi^2 = 4.912$, $df = 1$, $p < .027$).

The frequencies in the hypocrisy condition did not, however, differ from those in the mindful-only and commitment-only conditions. Indeed, the data from these three conditions were identical, with 14 out of 20 subjects in each group turning off the shower, compared to only 7 out of 20 in the control group ($\chi^2 = 7.742$, $df = 1$, $p < .005$).

TABLE I   Mean Shower Times (in seconds)

Condition	Mean	SD
Mindful-only	248.3	146.07
Commitment-only	247.7	104.05
Mindful/committed (hypocrisy)	220.5	100.62
Unmindful/uncommitted (control)	301.8	142.32

A manipulation check is an essential part of experiments. The experimenter is manipulating the Independent Variable(s) and is predicting that the different levels of the IV will have different effects on subjects' responses on the DV. But before we can have confidence in the results, we need to know that the IV had an impact on the participant. For example, if I was looking at the effects of anger and happiness on how people evaluated a story, I would need to randomly assign some to an angry mood induction condition and others to a happy mood induction condition. Immediately after the IV, I give participants a mood questionnaire in which they indicate the degree to which they are feeling various emotions. This will tell me if my manipulation of their moods worked.

TABLE 2   Frequency of Turning Off the Shower

Condition	Yes	No
Mindful-only	14	6
Commitment-only	14	6
Mindful/committed (hypocrisy)	14	6
Unmindful/uncommitted (control)	7	13

DISCUSSION

The first sentences of the discussion should tell the reader the main findings of the experiment and which (if any) hypotheses were correct.

The data from this experiment are consistent with our reasoning that higher levels of disso-nance would be aroused for subjects in the hypocrisy condition, leading them to make greater efforts to conserve water than subjects in other conditions. Specifically, it was only subjects in this condition who took significantly shorter showers than subjects in the control condition. Unexpectedly, however, shower times for hypocrisy subjects were not significantly shorter than times for subjects in either the mindful or commitment conditions, both of which fell midway between times for hypocrisy subjects and controls. In addition, subjects in the mindful and commitment conditions were just as likely as those in the hypocrisy condition to turn the water off while showering. In all three conditions, this behavior occurred significantly more often than in the no-treatment condition.

Overall, this pattern of data suggests the possibility that subjects in all three groups were motivated to conserve water, although this effect was strongest for those in the hypocrisy con-dition. That is, rather than experiencing *no* dissonance, subjects in the mindful and commit-ment conditions might have experienced some feelings of hypocrisy, albeit of a milder sort than their counterparts in the hypocrisy group. Subjects in the former conditions were exposed to manipulations that could potentially arouse some feelings of hypocrisy. For example, in the commitment condition subjects signed a flyer that stated: "Take shorter showers . . . If I can do it, so can you!" For subjects who had wasted water in the past, this statement might have been experienced as somewhat hypocritical, even without the mindfulness manipulation to heighten its effect. Similarly, subjects in the mindful condition first affirmed their pro-con-servation attitudes in the presence of the experimenter (recall that everyone answered "yes" to the initial question: "Are you in favor of water conservation?") and then were made aware of the discrepancy between their attitudes and behaviour—that is, the fact that they did not always take the shortest possible showers. This awareness could have aroused mild feelings of hypocrisy, or dissonance, for these subjects.

Why did subjects in these two conditions reduce dissonance by turning the water off, yet did not take shorter showers than controls? One possible reason is that turning the shower off is a fairly vivid and unambiguous way for subjects to demonstrate their commitment to conserve water. As such, it provides a natural "first step" for subjects who are motivated to conserve water, thus affording the clearest and most available route to dissonance reduc-tion. Unlike hypocrisy subjects, however, subjects in the mindful and commitment groups did not take the additional step of significantly reducing the duration of their showers, rela-tive to controls. This finding is consistent with our interpretation that hypocrisy subjects were

experiencing the highest levels of dissonance and, as a result, were more motivated to act in accordance with their principles: both by turning off the shower *and* actually using less water. Finally, it should be noted that our primary dependent variable, length of shower, is a true measure of water conservation—unlike turning off the water, which is simply one method of potentially achieving that goal.

Could the effects found in the present experiment be due to some cause other than dissonance arousal? For example, could subjects have taken steps to conserve water simply because their pro-conservation attitudes were made salient by the experimental manipulations? Although our manipulations may have partly served to "prime" subjects' attitudes, we think it is unlikely that the shower-time results are due to the mere effects of attitude accessibility or salience. To begin with, subjects in all three experimental conditions were, in one way or another, reminded of their favorable attitudes toward water conservation prior to taking a shower. Yet, only subjects in the hypocrisy condition showed a significant reduction in their actual water use. In addition, data from the condom experiments discussed earlier (Aronson et al., 1991; Stone et al., 1992) do not support a "priming" interpretation of the present findings. The results of these studies, which employed similar manipulations and were conducted under more controlled laboratory conditions, reflected significantly greater dissonance arousal among hypocrisy subjects compared to all other experimental conditions.

Still, it could be argued that in the present study hypocrisy subjects might have experienced a more potent priming effect, given their exposure to both the mindful and commitment manipulations. While this alternative explanation cannot be ruled out, a close look at the details of the procedure makes this interpretation seem less plausible. Specifically, subjects in the hypocrisy condition were treated identically to those in the mindful condition except that the former also signed a leaflet advocating others to conserve water. This leaflet contained no new information above and beyond that already presented in the mindful condition; it simply restated methods of conserving water in the showers. (Indeed, this information is also posted conspicuously in the shower room itself and in other prominent locations within the adjacent locker room.) Thus, it seems doubtful that in the hypocrisy condition this redundant information—presented briefly and only seconds after the more extensive mindfulness manipulation— could have contributed appreciably to any "priming effect" produced by either of the manipulations alone. Rather, we would argue that the impact of signing the leaflet was that it made hypocrisy subjects uncomfortably aware of having preached something they did not always practice, thereby accounting for their greater motivation to conserve water. Future research is necessary, however, to determine conclusively whether these findings are best explained by dissonance arousal or are the effect of increased accessibility of attitudes via priming. In particular, laboratory studies based on the "misattribution of arousal" paradigm in dissonance research (e.g., Zanna & Cooper, 1974) would shed needed light on this issue.

Although a "priming" interpretation cannot be entirely ruled out, taken together with the findings of Aronson et al. (1991) and Stone et al. (1992) our results suggest that feelings of hypocrisy can be dissonance-arousing, thereby motivating people to bring their behavior into closer alignment with their espoused ideals. In addition, in recent years it has been proposed that individuals must produce "foreseeable aversive consequences" in order to experience dissonance (Cooper & Fazio, 1984; see also Thibodeau & Aronson, in press). Our findings cast doubt on this new formulation of dissonance theory. Any consequences resulting from complying with the experimenter's requests could only serve to promote water conservation—by encouraging other people to save water, and by helping the "Water Conservation Office" with a

Most researchers spend a fair amount of time in the discussion examining alternate explanations for their results, as do the current experimenters, in the following three paragraphs.

survey. Far from being an aversive consequence, saving water was something that all subjects in the present study already supported.

Finally, in the present experiment subjects experienced dissonance in a pro-attitudinal advocacy paradigm. This represents a new twist on the counter-attitudinal advocacy manipulation traditionally employed in dissonance research and opens up new opportunities for applying the theory in real-world settings. In particular, interventions along the lines of our hypocrisy manipulation may prove successful in motivating people to act in accordance with their already favorable attitudes toward a given issue, such as water conservation, condom use, recycling, etc. Clearly, using dissonance arousal as a strategy for changing behavior is somewhat more involved than simply hanging signs or posting flyers. As noted earlier, however, research suggests that changes in attitudes and behavior generated by cognitive dissonance tend to be more permanent and may also transfer to new situations, as compared to changes produced by other means of persuasion (Aronson, 1980). In the long run, then, dissonance-related persuasion may prove to be a cost-effective method for policy makers to employ in a variety of settings, especially those in which the goal is to produce higher levels of consistency between attitudes and beliefs.

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POST-ARTICLE DISCUSSION

In social psychology, the concept of cognitive consistency has a long theoretical and empirical history. One of the early incorporations of this concept came with Fritz Heider's balance theory (Heider, 1958). Heider said that we are highly motivated to maintain balance (consistency) in our cognitions and in our relationships. If they become unbalanced, we are motivated to change something to make the situation balanced. For example, you have a friend, whom you like. Let's say your friend has another friend, whom you dislike. This triangle then becomes an imbalanced triad for you because of your dislike for your friend's friend. The stress and awkwardness of that other person in your life may be minor, in which case the imbalance isn't too strong and you will still keep your friend. But if that negative feeling is very strong, the imbalance will be so strong as to make you question whether being friends with your friend is worth all the hassle (the negative baggage of the other person in the picture).

Leon Festinger (1957)[1] expanded these ideas to formulate his influential cognitive dissonance theory. One might argue that Festinger's dissonance theory is the most famous or most influential in all of social psychology. Essentially, cognitive dissonance says that when people hold two inconsistent thoughts or an inconsistent thought and behavior, they feel a negative arousal (cognitive dissonance), which motivates the person to restore cognitive

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[1]Although Festinger took his inspiration from Heider, Heider's book came out a year after Festinger's. The simple explanation is that Heider had been publishing articles about balance for many years prior to the publication of his 1958 book.

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consistency by either changing one cognition or changing the way they think about the behavior.

The article you just read was coauthored by Elliot Aronson, who was a graduate student of Festinger's and later became a prominent advocate of cognitive dissonance theory in his research career. Aronson and his colleagues show in this paper that simply reminding people about their past failings in terms of water conservation (mindful only condition) or having them commit to trying to conserve water in the future (commitment only) was not enough to motivate behavior change. But when people say that conserving water is important and they publicly commit to do just that (by writing their name on the poster), they are reminded of how they have failed to conserve water. This failure creates dissonance. To eliminate the dissonance, they are motivated to bring their future water-conserving behavior in line with their public commitment, and in fact that is what they do. Cognitive dissonance is a powerful motive, and it can be used in productive ways to address social problems.

THINGS TO THINK ABOUT

1. When trying to get ideas for a good method to address a real-world problem like the one tackled in this paper (increasing water conservation), to what should researchers turn for inspiration?

2. Do you think that Experimenter 2 (the showering experimenter) may have caused the subjects to become suspicious in any way? Do you think Experimenter 1 questioning the subjects between the pool and the shower may have aroused any suspicion in the subjects? If so, how might you have designed it differently?

3. Why do you suppose the mindful-only or commitment-only conditions did not significantly alter water conservation compared to the control condition?

4. Can you think of other behaviors that this type of hypocrisy manipulation could affect such that it would have a positive effect on a real-world issue? For example, is there a way to design a hypocrisy manipulation into a commercial?