CHAPTER 22

Conducting Social Psychological Research in Educational Settings

"Lessons We Learned in School"

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Some people become social psychologists because they want to change the world, and others enter the field because they are captivated by theoretical issues and basic research. The social activist depends on basic research, and the basic researcher often tries to extend theory and research into the real world. The trade-offs between basic and applied research are particularly salient in the area of education, because most of us are educators who are trying to change the world through our teaching. It makes sense that those of us doing research in the areas of social cognition, social influence, motivation, and group behavior (to name just a few topics with obvious educational implications) would see and appreciate the applications of our basic research to education. It also makes sense that some of us would want to understand the educational process more deeply.

Sometimes we end up collecting data in educational settings out of convenience, because students in our classes can be a captive population (at least when we can gain access to those populations). The most obvious example is the reliance on students in introductory psychology classes who earn extra credit in their classes in exchange for participation in research. In other cases, researchers begin by studying basic phenomena in the laboratory but then extend their research to include studies conducted in classes and become more focused on educational issues over time. For example, Rosenthal studied self-fulfilling prophecy effects in a number of different settings, beginning with basic experimental studies, then extended his work to include social interaction studies, rat labs, the workplace, and the classroom. It was his experimental demonstration

of expectancy effects in an elementary school, reported in *Pygmalion in the Classroom* (Rosenthal & Jacobsen, 1966), that opened up a new line of educational research into the dynamics of teacher-pupil interactions (Rosenthal, 1987, 1991). As another example, Lepper, Greene, and Nisbett (1973) conducted a classic experimental study of self-perception and intrinsic motivation with preschool children in a university nursery school, then went on to conduct experimental studies of rewards and token economies in elementary school classrooms (Greene, Sternberg, & Lepper, 1978). Over time, Lepper has become more involved in educational policy, contributing articles on the importance of microcomputers in education (Lepper, 1985; Lepper & Gurtner, 1989).

Our own research concerns the effects of goals on motivation and performance, and we are interested in the goals that individuals set for themselves as well as the goals that can be suggested or assigned to individuals by other people. In particular, we have been interested in a class of goals known as achievement goals, which concern a person's reasons for engaging in an achievement-oriented activity. For example, people can pursue mastery goals, with a focus on learning and skill development, or performance goals, with a focus on performing well relative to others. Many theorists have adopted what we will term the *mastery goal perspective*, arguing that mastery goals are optimal for motivation and performance, whereas performance goals should have deleterious consequences (Ames, 1992; Dweck, 1986).

Our work on achievement goals started in the early 1990s. We began by using laboratory paradigms to examine the effects of experimentally manipulated mastery and performance goals on intrinsic motivation. One of the activities that we used was pinball games, and we had students play pinball under a mastery or performance goal. Contrary to the mastery goal perspective, our initial findings suggested that performance goals have some positive effects, especially for some individuals. These goals seemed to challenge our participants and get them excited about playing pinball. On the other hand, mastery goals proved optimal for other individuals and in other situations, and our findings suggested that goal effects might be more complex than implied by the mastery goal perspective (Harackiewicz & Elliot, 1993).

Over time, as we continued to document, replicate, and extend these experimental effects (see Harackiewicz, Barron, & Elliot, 1998, for a review), we too became interested in the educational implications of our findings and sought to extend our findings to educational issues. We would like to share our experiences as we made the transition from an experimental, laboratory-based research program to one that involved correlational studies of achievement goals conducted in college classrooms as well as longitudinal studies of college students' progression through their tertiary education. We should note that we haven't actually moved very far—from our labs in the basement to the lecture halls on the first floor of our building—but it has been a major transition for us, and we hope that our experience will inspire others to travel even farther. In addition, we will try to retrace our steps and discuss issues that a researcher can expect to face when moving into an educational setting.

MOVING OUT OF THE LAB AND INTO THE CLASSROOM: CHOOSING THE SETTING

The first challenge that we faced was choosing the educational setting to study. Education is a lifelong process, and a researcher might be interested in programs ranging from preschool through graduate school, or from vocational training to adult education programs. In our own research, we were interested in extending our experimental work with college students to the real world of college education, so it

made sense to conduct our studies in university lecture halls. Moreover, when we reviewed the achievement goal literature, we discovered that most researchers had worked in elementary and junior high settings, and we were surprised to find that not much goals research was being done in college settings. We therefore decided to focus on the college environment. We then decided to focus on a particular academic discipline—one in which we had some expertise and access—and decided to start our new program of research in introductory psychology classes.

The choice of educational setting has a number of implications for research design and procedures. Researchers may encounter logistical challenges in gaining access to appropriate populations. To start, a researcher needs to discuss research possibilities with educational administrators and must obtain permission to contact teachers and conduct research in that setting. The success of a project can depend on the cooperation of teachers and other staff who work with the students that the researcher wants to study, and it is critical to establish a good working relationship with them. Of course, the researcher will need to obtain the informed consent of the students themselves, and whenever research is conducted with minors, consent from parents or guardians must be obtained. This important requirement can pose logistical problems in terms of distributing and collecting consent forms. It is also important to check on the legal definition of a minor with the local institutional review board, because these legal definitions can vary in different parts of the country. For example, even with a study in a college setting, many entering college freshmen still may be under the legal age required for adult status and may require special consent procedures. Addressing all these logistical issues will take time, and our best advice is to plan ahead—really far ahead!

If a researcher only has experience studying students at his or her own university, it may seem daunting to gain access to participants outside the university. However, we can offer a few suggestions for getting started. To find preschool or elementary educational settings, we recommend talking with colleagues who already work with children (e.g., in developmental psychology or language research) for possible leads (see Pomerantz, Ruble, & Bolger, Chapter 18, this volume). They may have already established contacts and the precedent for conducting research at a particular school. Personal contacts can be invaluable; perhaps a teacher or administrator can facilitate access to a school. For example, the first author's mother was an English teacher in a public high school, and she allowed her daughter to collect her dissertation data in her classroom. Alternatively, we recommend contacting school superintendents and/or principals at individual schools to inquire about the possibilities for research and about the protocol to follow at the various institutions. Public schools in university towns are often besieged with requests from researchers and must limit access. One final tip is that it is sometimes easier to collect data in private schools, where there may be fewer researchers petitioning for access and less bureaucracy to negotiate. Of course, one possible downside of this strategy is that private schools may represent more specialized populations, limiting the generalizability of findings.

Even at the researcher's own university, access to students should not be taken for granted. It is important to discuss research possibilities with the chair of a department and the instructors of the courses in which the researcher hopes to collect data. The study needs to be approved by institutional review boards, and students must give their informed consent. To access academic records, explicit permission from students is required, and these issues should be discussed with the institutional review board. For example, once we became interested in studying achievement goals in introductory psychology classes, we discussed our plans with the chair of our department and the instructors of the class. In

some projects, we collected data from students who participated in our research outside the actual classroom for extra credit, as part of the departmental research participation program. In other projects, we collected data in classes with the permission of instructors. In our longitudinal studies, we discussed access to student records with the university registrar's office. Each study required a different negotiation with departmental administrators and instructors.

MOVING INTO THE CLASSROOM: CHOOSING A DESIGN

The next challenge we confronted was deciding what kind of research design would be adequate for testing our hypotheses about goal effects, and what kind of design might be feasible in this research context. It was clear what our independent variable was: achievement goals. But how should we study their effects in a college classroom? As we mentioned earlier, goals can be self-set or externally suggested; for example, a teacher might recommend that students try to master a new math technique, or students might adopt a mastery goal as they learn new math skills. Theorists have argued that self-set and external achievement goals should have similar effects, and many have discussed these types of goals interchangeably. We suspect that there are important differences between these types of goals, however, and think it is important to study goals from both perspectives. If we examine the goals that students freely adopt in college classes, with correlational designs, we can learn a lot about relationships between motivational variables and performance in real world contexts. If we manipulate external goals, as we did in the lab, we can learn a lot about causal effects. From a theoretical perspective, both correlational and experimental designs were appropriate for testing our hypotheses.

From a practical perspective, however, it seemed important to begin our educational research with correlational designs. First, and understandably, educators are much more willing to let researchers come into their classes and administer questionnaires than they are to allow researchers to come in and manipulate features of the educational environment. Leaving the lab means giving up control and working within real world constraints. It is not impossible to conduct an experimental study in classrooms (in fact, the research programs of Rosenthal and Lepper discussed at the beginning of this chapter are both good examples), but it takes a very special relationship with educators to gain the access and control necessary to conduct true experiments in classrooms. Second, even if social psychological researchers could gain access and the ability to manipulate educational factors, they should not rush to conduct intervention studies that might have unanticipated or deleterious effects on students' learning or performance. We believe that it is more feasible and ethically responsible to begin with observational and correlational methods in an educational setting and learn as much as possible about the environment before implementing experimental designs. Of course, our ultimate goal may be to change the world by improving education, and experimental intervention studies will be essential sooner or later. We simply recommend that they come later in a program of research, and only when ethically appropriate. Some research topics may never be ethical to study experimentally, and non-experimental designs may be the only choices available (see Mark & Reichardt, Chapter 12, this volume).

MOVING INTO THE CLASSROOM: CHOOSING MEASURES

Once we decided to conduct survey studies in college classes and measure our independent variable (students' self-reported achievement goals), our next challenge was to choose appropriate dependent variables and select

educational variables that tapped the theoretical constructs in which we were most interested. Our research questions have centered on how goals affect motivation and performance, and in the lab, we have examined performance in terms of pinball scores, and we have measured intrinsic motivation with both self-report questionnaires and behavioral measures. When we moved to the college classroom, we had to decide how to measure motivation and performance in this context. One great advantage of our new research context was the ability to study real world variables with longitudinal designs. We measured students' goals at the beginning of their introductory courses, and we collected outcome measures over the course of the semester. The obvious measure of performance in academic settings is grades, and they provide fairly objective measures of students' success in a course. We obtained final grades directly from departmental records (with the consent of students and instructors). When we measured performance in courses taken later, we obtained grades from students' transcripts obtained through university offices (again, with the consent of students). However, in addition to performance, we consider interest to be a critically important educational outcome (Dewey, 1913; Harackiewicz, Barron, & Elliott, 1998; Jackson, 1968; Maehr, 1976). Nicholls (1979) argued that interest, especially when it endures beyond a particular educational experience, is a particularly significant marker of success in education because it can fuel lifelong learning, and we concur. It was therefore important to design measures of academic interest for our research.

Dependent variables measured in the laboratory are sometimes artificial or abstract, but conducting research in educational settings allows a researcher to measure outcome variables in terms of significant real world outcomes. The theoretical constructs are the same, but these operationalizations can give more weight to our theories. We can also measure outcome variables that span much greater time periods than the typical laboratory research paradigm permits. For example, in our pinball research, we would surreptitiously observe participants to measure how long they played pinball when left alone for 5 minutes at the end of the study, on the assumption that their decision to return to the game reflected their intrinsic interest in the pinball game. When measuring intrinsic motivation in educational settings, we have collected behavioral measures of continued interest by following students throughout their entire undergraduate careers to measure the number of additional psychology courses that they have taken (e.g., Harackiewicz, Barron, Tauer, & Elliot, 2002). This measure, which we coded from academic transcripts, reflects a student's continuing interest in psychology and corresponds to our free-choice measure of pinball interest because college students are free to choose their courses, just as our research participants are free to choose whether to play more pinball when left alone. Thus, our choice of outcome measures has been dictated by our theoretical interests, influenced by our laboratory work, and colored by our consideration of what educational outcomes are important to educators.

MOVING INTO THE CLASSROOM: IMPLICATIONS AND METHODOLOGICAL TRADE-OFFS

In our longitudinal classroom goal studies, we continued to find positive effects for both performance and mastery goals, challenging the mastery goal hypothesis (Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997; Harackiewicz, Barron, Tauer, Carter, Elliot, 2000; Harackiewicz, Barron, Tauer, & Elliot, 2002). Students who adopted performance goals attained higher grades in the course, whereas students who adopted mastery goals reported more interest and took more psychology courses over the course of

their undergraduate careers. Most theorists would have predicted that students pursuing only mastery goals would have been the most successful. However, we found that students who adopted both types of achievement goals were best off—they were more likely to be interested in the class *and* to perform well. Thus, the results of our lab and classroom studies, along with results emerging from other investigations (see Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002, for a review), led us to adopt a *multiple goal perspective*, in which we have argued that the evidence to date warrants a major revision of achievement goal theory (Barron & Harackiewicz, 2000; Harackiewicz, Barron, & Elliot, 1998; Harackiewicz, Barron, Pintrich, et al., 2002). Our ideas have been controversial, and many issues remain unresolved. We are engaged in ongoing discussions with researchers in the field (Kaplan & Middleton, 2002; Midgley, Kaplan, & Middleton, 2001), but we will not go into the complexities of this debate here. Rather, we hope to illustrate methodological issues raised by our research on this topic as we have moved from the lab to the classroom (and back again), and to discuss several trade-offs that became salient in our journey. These trade-offs can be considered in term of three types of validity: external, internal, and construct validity (Campbell & Stanley, 1963; Cook & Campbell, 1979).

The classic issue when deciding whether to conduct research in the lab or in the real world of education involves the trade-off between external and internal validity. External validity involves evaluating whether or not the results of a particular study can be generalized to other people, places, or times, and internal validity involves evaluating whether or not cause-and-effect relationships have been established between variables. Of course, the only research design that permits clear and unambiguous cause-and-effect statements involves experimental methods. Designing a laboratory experiment that is high in both external and internal validity has been the topic of great debate (e.g., Mook, 1983; Sears, 1986) and has been labeled "the dilemma of the social psychologist" (Aronson, Wilson, & Brewer, 1998). Our field tends to rely on experimental methodology to answer cause-and-effect questions, and these studies often lack external validity. Our own laboratory studies were no exception. Despite documenting causal goal effects in our lab, we were not in a strong position to argue that our initial experimental results were relevant and generalizable to education. Of course, we believed that our findings were relevant because our manipulations mirror the kinds of goals that teachers might set for their students as they begin an interesting learning task. But could we really make the case for educational relevance based on experimental goal manipulations for pinball games? How would the general public and policy makers (school boards, legislators, etc.) view our results, and did this open us up to easy criticism from skeptical colleagues? We were studying basic motivational processes that should operate in educational settings, but it still seemed a big jump to educational implications. Our college classroom research added important evidence for the external validity of our work.

We could not make a straightforward case for external validity, however, because our experimental findings from the lab did not line up directly with our correlational findings in the classroom. Both paradigms revealed beneficial effects of both mastery and performance goals, and no one single goal proved optimal in either the lab or classroom setting, thereby providing support for the multiple goal perspective. However, the specific pattern of findings was different across our experimental and correlational studies. Because of numerous differences between these research paradigms (type of activity—pinball versus academic coursework; importance of activity—leisure

activity versus academic work; type of goal—manipulated versus measured), it is impossible to determine what was responsible for the different results between paradigms. A similar point was raised by Middleton and Midgley (1997), two of our colleagues in educational psychology, who noted the difficulties of comparing experimental laboratory results with those obtained in the classroom. Their comments concerned differences between an experimental study by Elliot and Harackiewicz (1996) and their own classroom study:

> The results from our study in the field lead us to some different conclusions than those of Elliot and Harackiewicz (1996) in the laboratory. Contrasting methodologies may account for the differences. Elliot and Harackiewicz conducted experimental studies with college-aged students using puzzle-like tasks; whereas our study focuses on an academic setting, specifically the mathematics classroom, with middle school students. (Middleton & Midgley, 1997, p. 715)

Concluding that different results may be due to the methodology employed is less than satisfying when trying to come to a conclusion about debates in the achievement goal literature or any area of educational research, but this highlights the theoretical and applied significance of the methodological choices that we make.

MOVING BACK TO THE LAB

To address the discrepant pattern of findings between our early experimental studies and classroom work, we returned to the lab, where we could create a learning context and control for many of the differences between previous studies. We (Barron & Harackiewicz, 2001) conducted two studies back in the lab but used both correlational and experimental methods to study the effects of self-set and assigned goals. To accomplish this, we had students take part in an academic learning activity (rather than the pinball or other leisure/game activities that we had used in the past). Specifically, participants were taught new methods for solving everyday math problems. These methods outlined simple strategies to add, subtract, multiply, and divide mentally rather than having to rely on more traditional strategies of working out problems with a calculator or paper and pencil. Then participants' achievement goals for the session were either measured via self-report (Study 1) or manipulated, such that participants were randomly assigned to one of three conditions: mastery only, performance only, or both goals (Study 2).

In Study 1, when students reported their level of achievement goals for the learning session, we replicated the pattern found in our college classroom studies (e.g., Harackiewicz, Barron, Carter, et al., 1997, Harackiewicz, Barron, Tauer, Carter, et al., 2000; Harackiewicz, Barron, Tauer, & Elliot, 2002). Specifically, mastery goals were the sole predictor of *interest* in the math activity, whereas performance goals were the sole predictor of *performance* on the math problems, providing further support for the multiple goal perspective. We found the same pattern of effects in a 45-minute learning session that we found in a semester-long college course, suggesting that our laboratory-based learning program was relatively high in external validity and might even be a good paradigm to use for intervention studies.

When goals were experimentally manipulated and assigned to participants in Study 2, we found a different pattern of effects. On interest outcomes, no single goal was optimal for all participants. Instead, the effects of assigned goals were moderated by personality characteristics of the participant, specifically their general achievement orientation. These results replicated our previous findings based on pinball (e.g., Harackiewicz & Elliot, 1993)

and suggest that our experimental findings generalize to important learning activities as well as leisure activities. Thus, once again, we found that mastery and performance goals both can have positive effects (in this case, different goals were beneficial in promoting interest for different people).

In sum, both studies revealed that mastery and performance goals can each promote important outcomes relevant to education, but that the patterns differed depending on whether goals were self-set (Study 1) or assigned (Study 2). When goals were assigned, a more complex relationship involving achievement goals and individual differences was found. Thus, the benefits of self-set goals observed in Study 1 could not be reproduced simply by assigning goals in Study 2. Because we took careful steps to control for other variables that have made previous comparisons between correlational and experimental goal studies difficult (e.g., differences in type of task, type of environment, or age of population), we were now in a better position to conclude that the differences observed across Study 1 and Study 2 involved the origin of the goal. One lesson that we learned from this pair of studies was that we should not equate self-set and manipulated goals, and our theoretical analysis has become more careful and nuanced as a result. Thus, with careful methodological work, it is possible to integrate correlational and experimental methods to learn more about the nature of goal effects.

BACK TO THE CLASSROOM: VALIDITY ISSUES REVISITED

There is no doubt that moving out of the lab and into an educational setting can have a number of advantages. First and foremost is the obvious benefit of generalizing results to important real world issues and establishing external validity. In addition, classroom research can be convenient (especially if conducted with students at the researcher's own university) and relatively easy to implement. Researchers also can obtain large samples of participants, aiding both external validity and statistical power. For example, we have been able to collect data in samples ranging from a few hundred to 3,000 student participants, yielding considerable statistical power to test our theoretical ideas. Although access to larger samples can be seductive, we have found it especially important to consider the statistical versus meaningful significance of our findings in our large-scale classroom studies. It is also important to remind ourselves that our larger sample sizes do not guarantee external validity, and that we need to be very careful about generalizing our classroom findings. For example, although our college classroom studies have more external validity than our lab research, we have only scratched the surface of the external validity question. Studying goal dynamics in introductory college courses certainly does not address all external validity concerns. Rather, it raises a host of related questions about how far these educational results might generalize. Will the same results generalize to upper-level college courses, classes in other majors, or classes in other types of schools (e.g., small liberal arts colleges)? Will the same relationships generalize to elementary, junior high, and high school students? These are some of questions that we are trying to address in our current research.

So far, we have focused on the trade-offs between external and internal validity and the theoretical progress made as a result of going back and forth between the lab and the real world. We turn now to construct validity, and we would like to highlight how research in classroom settings has informed our work with theoretical constructs in the context of the mastery versus multiple goal debate. Construct validity entails evaluating whether one has successfully measured or manipulated the theoretical constructs of interest. The early achievement goal literature is replete

with different measures and labels used to capture the different types of achievement goal construct. Moreover, as we have noted, some researchers discussed goal manipulations and questionnaire measures interchangeably. However, our transition from the lab to the college classroom forced us to think more carefully about goals and about what we really mean by a goal. Our questions about goal origin effects, discussed above, actually are questions about construct validity. For example, is a goal something that can be manipulated directly? Do we assume that individuals all accept and adopt externally suggested goals? Is receiving a performance goal manipulation ("We suggest that you try to outperform other students on these problems") equivalent to endorsing a performance goal on a questionnaire ("It is important for me to do better than other students in this class")?

It is important to recognize the theoretical implications of our methodological choices and to temper our conclusions accordingly. For example, early research was based on a dichotomous model that pitted mastery goals against performance goals. Similarly, some researchers used forced-choice questionnaire measures of self-adopted goals that forced individuals to choose between one goal and the other. In both cases, these research designs failed to offer an adequate test of multiple goal effects. When researchers have measured goals independently on separate scales, they have consistently found that mastery and performance goals are uncorrelated or positively correlated (see Hidi & Harackiewicz, 2000, for review). Thus, rather than pursuing one goal to the exclusion of the other, students are just as likely to report pursuing both goals. Thus, careful questionnaire design has led to a clearer theoretical picture of goals as independent constructs (Finney, Pieper, & Barron, in press).

Our understanding of goal dynamics has deepened as a result of measuring these constructs in real world settings. A major benefit of conducting studies in large college classes is that we have been able to survey numerous items to tap particular constructs, and then evaluate the underlying structure of our theoretical constructs through exploratory and confirmatory factor analysis. As a result, we have a better understanding of the constructs that we hope to manipulate in the lab and can design more effective experimental manipulations of these constructs. Thus, experimental manipulations can be informed by careful construct validation work conducted in the field.

In addition to considering the construct validity of our goal measures and manipulations (i.e., our independent variables), it is also important to consider the construct validity of our outcome measures (i.e., our dependent variables). For example, goal theorists have argued that researchers should examine a variety of educational outcomes and should consider both adaptive (e.g., academic performance) as well as maladaptive outcomes (e.g., cheating). In other words, by exploring a wider range of outcome variables, we may discover benefits and potential costs associated with pursuing a particular goal or combination of goals as we carefully think through and debate the mastery goal versus multiple goal perspectives. The richness of the real world setting of a classroom provides researchers ample opportunity to consider a wide range of potential outcome variables in addition to performance—such as study strategies, level of processing, effort, self-handicapping, and cheating—in order to gain a fuller understanding of goal effects (Butler, 2000; Midgley et al., 2001).

In our own work, we broadened our conceptual definition of academic success to include interest as well as academic performance. By using a multifaceted definition of success, we were able to document that different achievement goals were linked to different aspects of academic success. If we had used a narrower measure of success, we might have drawn very different conclusions. For

example, if we had considered only interest, we would have concluded that mastery goals are optimal and inferred strong support for the mastery goal hypothesis. In contrast, if we had considered only grades, we would have concluded that performance goals are optimal and would have claimed no support for either the mastery goal or multiple goal perspective. Instead, by considering both outcomes as important educational outcomes, we acquired a better understanding how both goals can predict positive outcomes in college education.

LESSONS WE LEARNED IN SCHOOL

As we noted at the beginning of this chapter, we are certainly not the first social psychologists to leave the lab to test theory in a classroom setting, and we hope we are not the last! We have tried to show how much we have learned from moving between the lab and field, and how this has helped us address the current debate in achievement goal theory. We would like to conclude with a summary of three lessons that we have learned along the way.

Lesson #1: The Importance of Using Multiple Research Methodologies in Multiple Settings

By using a range of research designs (in particular, correlational, experimental, and quasi-experimental designs) and by moving between the lab and field, we have gained a deeper appreciation for the strengths and weaknesses of different research methodologies and the conclusions that our work allows us to draw. In other words, we have moved beyond a "textbook" understanding of the pros and cons of particular methods to a firsthand appreciation of the unique benefits of each type of design. A social psychologist needs many methodological tools and cannot rely solely on experimental designs. We hope that the examples from our own work show how different research methodologies can complement each other, and how comparisons between them can also generate new ideas for future research.

We hope it is clear that moving into the classroom to conduct research does not dictate a particular research approach, nor does it necessarily limit methodological choices. We have been interested in whether we can promote interest with externally assigned goals, and we have been interested in whether students' goals predict academic success over the course of their undergraduate careers. As a result, our work in educational settings has been predominantly correlational, whereas our laboratory work has been predominantly experimental, but we have also conducted correlational designs in lab settings, as discussed earlier (Barron & Harackiewicz, 2001), and we are currently planning some experimental studies to be conducted in classrooms. We believe that the choice of educational research design should be based primarily on the theoretical questions. If we are trying to answer a causal question about how to promote interest, or a question about the effectiveness of an educational intervention, then of course we need experimental methods. If our research question is descriptive or predictive in nature, however, and we are interested in the predictors of optimal motivation in college, then non-experimental designs are appropriate.

In addition to theoretical considerations, we have come to appreciate the importance of practical and ethical issues. On practical grounds, it is important to consider potential limitations or barriers that may be encountered when conducting research in an educational setting (e.g., the amount of access and the degree of control). Thus, a researcher may decide that he or she is limited to a particular design by the constraints faced. Or, it may be more practical and advantageous to begin with a non-experimental approach that allows

the researcher to become knowledgeable about a particular sample and develop good working relationships with school administrators and teachers before trying to implement an experimental design in a classroom. Finally, it is important to consider ethical issues because manipulating some educational variables or giving/withholding a particular intervention could be inappropriate.

Furthermore, although we have not gone into detail about the statistical procedures used in our different research designs, it is important to note that diverse methods require diverse statistical analyses. As a result, we have also gained a deeper appreciation for the benefits of using different statistical techniques to address our research questions (such as factor analysis, multiple regression, path analyses, moderation/mediation, hierarchical linear modeling, and latent growth modeling), and we have enjoyed learning new techniques to analyze our increasingly complex research designs. Other chapters in this volume (West, Biesanz, & Kwok, Chapter 13; Gonzalez & Griffin, Chapter 14) provide overviews of the variety of statistical procedures available to researchers working with complex, real world data.

Finally, our horizons have broadened as a result of working in educational settings. We have been exposed to new colleagues in different academic disciplines who have a lot to contribute to our understanding of motivation and performance. For example, we have broadened our reading beyond social psychological journals to include a number of educational research publications (e.g., *Journal of Educational Psychology*, *Contemporary Educational Psychology*, and *Educational Psychologist*), and we have begun attending a wider range of conferences (e.g., the American Educational Researchers Association annual conference). As a result, we have found new outlets in which to share and present our work, and we publish our goals work in both social psychological and educational journals, depending on our focus (see Salovey & Steward, Chapter 20, this volume, for a similar discussion in the health domain). In sum, our theoretical analyses have been enriched by our use of multiple methodologies and exposure to new academic disciplines.

Lesson #2: Dealing With the Dilemma of the Social Psychologist

Our initial decision to move out of the laboratory setting into an academic setting (as well as our subsequent decision to move back and forth between these environments) has been well rewarded. We have gained new insights into goal dynamics, and we have improved the construct, external, and internal validity of our work. Social psychologists who are interested in educational issues have a number of real world environments available in which to test and verify their ideas, some of which are as close as the classroom outside their office door or perhaps found at the high school on the way home from work. Although Aronson et al. (1998) noted that it is nearly impossible to design an experiment that is high in both internal and external validity, our work in classroom settings has helped us establish external validity for our work. More important, our classroom work inspired us to bring the classroom back into the laboratory, and we were able to design a laboratory paradigm with greater external validity than many of our earlier experiments (Barron & Harackiewicz, 2001). We think we are closer to balancing internal and external validity in the same study, as well as balancing them across different lines of research. This is an ongoing challenge.

Lesson #3: Increasing the Credibility and Valuation of Research

We also realized that beyond strengthening the external validity of our work, the

benefits of moving out of the lab into an educational setting can also affect the perceived credibility of our work. Consider our earlier example in which educational psychologists (Middleton & Midgley, 1997) discussed the differences between Elliot and Harackiewicz's (1996) achievement goal findings based on an experimental, laboratory paradigm using leisure activities and their own correlational findings in middle school math classes. Which research study is more likely to be valued and considered informative? In particular, which study would the general public and policy makers weight more heavily? Although our lab research with pinball and other leisure activities afforded a tightly controlled experimental design that was high in internal validity, it obviously can be critiqued on its external validity. In contrast, Middleton and Midgley's classroom research, although higher in external validity, was correlational and can be critiqued on its internal validity. In their study, as in our own classroom studies, we have been unable to evaluate causal relationships. In our own work, we have been quick to note this limitation and do not claim that adopting a performance goal causes students to perform better in their class. Instead, we recognize the possibility that students who have a history of performing well in classes might be more likely to adopt performance goals and continue performing well. Similarly, students who are initially interested in a course topic might be more likely to adopt mastery goals and remain interested in the topic. It is important to document these important relationships, but it would be a mistake to formulate policy on the basis of correlational findings.

Policy makers interested in interventions should weight studies high in internal validity, but they may not attend to studies unless they are also high in external validity. When researchers are attentive to both internal and external validity issues, they can increase the credibility and potential utility of their work. A number of psychologists have made strong cases for the benefits of staying in the controlled environment of the lab, despite critiques of limited external validity. For example, Mook (1983) argued in defense of external *invalidity* and strongly defended research paradigms that may lack direct real world linkages. He suggested that not all research is designed to address external validity, nor should it be. We agree. However, for others to value and appreciate the significance of our work (whether they are colleagues from different academic disciplines, policy makers, or the general public), we also need to consider what data they will find most compelling. In the final analysis, we need to consider our own goals for our science: If we do care about policy and changing the world, we must attend to concerns about external validity, but without losing the fierce commitment to internal validity that defines us as experimental social psychologists.

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