Psychological Inquiry, 19: 90–98, 2008

ISSN: 1047-840X print / 1532-7965 online
DOI: 10.1080/10478400802049860

Psychology Press
Taylor & Francis Group

The Opposite of a Great Truth Is Also True: When Do Student Samples Help Versus Hurt the Scientific Study of Prejudice?

Nilanjana Dasgupta and Matthew Hunsinger
University of Massachusetts–Amherst

Koan 7: The Opposite of a Great Truth is Also True
— McGuire (1973, p. 455)

McGuire's seventh koan in his 1973 article beautifully summarizes our response to Henry's target article in the current issue of *Psychological Inquiry*. It is true that using student participants to investigate the nature of prejudice and stereotyping can be problematic in some situations and these problems should not be underestimated. But it is also true that delving into the mind of students offers many benefits to the scientific understanding of the causes and consequences of prejudice. As McGuire wisely noted in his perspectivist approach to conducting research, a fruitful way to synthesize such opposing claims is to identify the specific conditions under which each claim is true (McGuire, 2004a, 2004b). In that spirit, the present article identifies some conditions under which the heavy reliance on student participants is likely to stunt theory building and scientific discovery in social psychology. We then consider the opposite: the conditions under which the use of student samples benefits social psychology. In both cases, existing experiments are used as illustrations; these are drawn specifically from research on prejudice and stereotyping.

When psychology parted ways with philosophy and found a new home with the sciences, it acquired a new intellectual sensibility that involved using the scientific method to answer questions about the nature of human cognition and behavior (Benjafield, 2005; Wertheimer, 2000). A key feature of the scientific method in the context of social psychology is to articulate general principles that guide social cognition and behavior and to specify their causes and consequences in ways that apply to most people most of the time. These general principles form the foundation of psychological theories. Theory building, theory testing, revising, and applying theories to inform social problems are central research activities in social psychology (Anderson, Lindsay, & Bushman, 1999; Campbell & Stanley, 1967; Cronbach, 1957; Mook, 1983). The critical importance of theory building and testing means that concern about internal validity is rightfully located front-and-center of the research process. Internal validity is why we place such premium on experimental control, on identifying and manipulating causal variables to test whether they produce changes in prejudicial responses, and on uncovering psychological processes that mediate between causal antecedents and prejudicial outcomes.

However, in pursuing internal validity (clearly, a strength of scientific research) we as investigators sometimes rely too heavily on easily obtained convenience samples, which exposes our Achilles' heel. In some cases, relying almost exclusively on student samples limits our understanding of the causes and consequences of prejudice and stereotyping and unduly restricts the development of theories and general principles of human social behavior in ways that are spelled out next.

When Do Student Samples Hurt the Scientific Study of Prejudice and Stereotyping?

Restricted Range in Student Samples Is an Obstacle to Theory Development

As noted by Henry and others, college students sometimes express a restricted range of responses when it comes to their attitudes and behavior (Fiske, 2004; Henry, this issue; Oyserman, Coon, & Kemmelmeier, 2002; Peterson, Duncan, & Pang, 2002). In the context of intergroup relations, given that on-campus community norms typically favor egalitarian values (Lottes & Kuriloff, 1994), this restriction of range is particularly likely to apply to attitudes and behavior toward disadvantaged social groups. This can attenuate the relationship between prejudice and its antecedents or consequences thereby presenting an obstacle to theory development. Two examples illustrate this point.

We first learned this lesson from our own experience while investigating the relation between implicit antigay prejudice and discriminatory behavior toward gay men (Dasgupta & Rivera, 2006). In our research we were attempting to specify the conditions under which implicit antigay prejudice would evoke subtle discriminatory behavior toward gay interaction partners versus other conditions that would attenuate such an attitude–behavior relation. We predicted that conscious egalitarian beliefs and the ability to control one's behavior were critical variables that ought to moderate the relation between implicit prejudice and behavior.

Our initial attempt to test this hypothesis using a sample of mostly college students confirmed the prediction for male participants, but not for female participants (Dasgupta & Rivera, 2006, Experiment 1). Specifically, for men who consciously endorsed traditional beliefs about gender and who were unskilled at behavior control, implicit antigay prejudice resulted in subtle antigay behavior. Other men who endorsed egalitarian beliefs or who were highly skilled at monitoring their behavior did not show behavioral bias regardless of their implicit attitudes. Women, however, did not conform to these predictions regardless of their conscious beliefs or behavioral control—their implicit attitudes toward gay men did not predict their behavior across the board. At first blush, this sex difference pointed in the direction of a different theoretical explanation than the one we had originally proposed: Perhaps men's attitudes and behavior were more closely aligned because they felt threatened by a same-sex gay person whereas women's attitudes and behaviors were not aligned because a gay man was not personally threatening. However, a closer examination of our data cautioned against discarding our original hypothesis because it had not been tested adequately among female participants. Women in our sample were overwhelmingly egalitarian in their gender-related beliefs, which created a serious restriction of range.

In a follow-up experiment, we actively recruited nonstudent participants from a city outside the college area (Dasgupta & Rivera, 2006, Experiment 2). This time both female and male participants' gender-related beliefs and behavioral control showed robust variability, and as predicted, implicit antigay attitudes spilled over into negative actions when participants (regardless of sex) lacked conscious egalitarian beliefs and control over their subtle behaviors. The presence of either conscious process (egalitarian beliefs or behavioral control) attenuated the attitude–behavior relation. Our take-home lesson from this experience was to be particularly alert that using student samples may create a restricted range in participants' responses, which in turn may mask hypothesized relationships between prejudice-related variables and lead to the premature abandonment of accurate hypotheses.

A second example that illustrates how restricted range in student populations may constrain theory development comes from intergroup contact. More than 50 years of research has repeatedly demonstrated that contact with members of outgroups significantly reduces prejudice toward those groups (Pettigrew, 1998; Pettigrew & Tropp, 2006). In their influential meta-analysis, Pettigrew and Tropp reported an interesting finding that had remained unnoticed in individual studies: The relationship between intergroup contact and prejudice reduction was significantly stronger for students compared to nonstudent adults. In other words, intergroup contact was particularly effective in reducing prejudice among participants whose age range was restricted to traditional student samples; it was less effective among older adults. This was an important discovery for both theoretical and practical reasons. From a theoretical standpoint, this finding may lead to the development of an interesting line of research examining why students are particularly open to intergroup contact. Is it because traditional-aged students are at a developmental stage where their attitudes and self-concept are more malleable than their nonstudent counterparts (Jennings & Markus, 1984; Hoge, Johnson, & Luidens, 1993; Perry, 1999)? Alternatively, is it the case that powerful campus norms that favor egalitarianism, rather than developmental life stage, is the reason why students benefit from contact more than nonstudents who live in communities where egalitarian norms may not be quite as strong (Lottes & Kuriloff, 1994)? The difference between students and nonstudents discovered by Pettigrew and Tropp opens up the possibility of modifying and extending intergroup contact theory in innovative directions. From a practical standpoint, prior knowledge about which populations are more versus less sensitive to intergroup contact has the potential to promote effective interventions that are targeted to appropriate populations.

Students Lack Particular Psychological Characteristics That Are Important to Theory Development

How do prejudice and stereotypes influence members of disadvantaged groups? This question has spurred burgeoning empirical research on stigma in the last 20 years. A large portion of this research has focused on the impact of stereotypes on academic performance (Steele, 1997; Steele, Spencer, & Aronson, 2002; see Shapiro & Neuberg, 2007), self-esteem (Klaczynski, Goold, & Mudry, 2004; Panayiotou & Papageorgious, 2007; Ward, 2004), and cognitive functioning (Schmader & Johns, 2003; Shelton, Richeson, & Salvatore, 2005), which can be easily investigated in student populations. One might argue that the heavy reliance of student samples has limited the investigation of the diversity of ways in which stereotypes affect stigmatized individuals. For example, only in recent years have social scientists begun to examine the influence of stereotypes and prejudice on stigmatized individuals' physical health, mental health, memory, and medical decision making. Because problems with health and memory are not common in young students, these outcome variables have been understudied in social psychology.

For example, recent research using older nonstudent samples has found that knowledge of negative ingroup stereotypes has profound effects on older adults' memory and medical decision making (Levy, 2003), African Americans' physical health (Krieger & Sid-

ney, 1996; Paradies, 2006; Williams, 1999), and gays and lesbians' physical and mental health (Cole, Kemeny, & Taylor, 1997; Meyer, 1995; Millard, 1995; Robertson, 1998). A recent meta-analysis of 138 empirical articles on experiences of racism and health outcomes included 126 studies with adults and 15 studies with students (Paradies, 2006). The relationship between prejudice and negative health outcomes, such as high blood pressure, tended to be significantly weaker for college-aged adult samples than middle-aged samples. For example, Guyll, Matthews, and Bromberger (2001) found a standardized regression coefficient of .22 for the predictive effect of frequent experiences with prejudice on blood pressure reactivity among middle-aged African Americans. In contrast, other studies with younger college-aged African Americans found substantially smaller standardized coefficients (Bowen-Reid & Harrell, 2002; Krieger & Sidney, 1996).

Similarly, the negative impact of stereotypes on memory and cognitive functioning is often more dramatic for older adults than college students. As noted by stereotype threat theory, making one's group membership salient to an individual who belongs to a stereotyped group impairs his or her performance on stereotype-relevant tasks (Steele, 1997; Steele, Spencer, & Aronson, 2002; see Shapiro & Neuberg, 2007). Most of this research has focused on performance outcomes that are easily observed in college students such as academic test performance (Spencer, Steele, & Quinn, 1999; Steele & Aronson, 1995). Only recently have researchers begun to examine the negative effect of stereotypes in domains other than academic testing. As a case in point, because cognitive functioning tends to decline in late adulthood (Finkel, Reynolds, McArdle, Gatz, & Pedersen, 2003; Lyketsos, Chen, & Anthony, 1999), people tend to assume that all elderly individuals have bad memory. When older adult are reminded of the negative memory stereotype associated with aging they tend to perform worse on subsequent memory tasks (Hess, Auman, Colcombe, & Rahhal, 2003) and show a physiological stress response (Levy, Hausdorff, Hencke, & Wei, 2000). Negative age stereotypes can even influence people's medical decisions about life and death. When elderly individuals were primed with negative aging stereotypes and asked to make a hypothetical decision involving accepting or rejecting life-prolonging interventions, they tended to refuse such interventions (Levy, Ashman, & Dror, 1999).

These two examples illustrate that broadening the study of stigma beyond student samples to include middle-aged and older adults illuminates the wide-ranging impact of prejudice on physical health and cognitive functioning. It benefits psychological theory by focusing attention on the interplay between the social environment, individual psychology, and human physiology thereby blurring the boundary between psychology and biology. Finally, recruiting older samples of participants allows us to investigate the cumulative long-term impact of prejudice and stereotypes across the life span.

Some Prejudice-Relevant Contexts Cannot Be Captured in Academic Environments

Even though the power of situations is evident from classic laboratory studies (Milgram, 1965; Zimbardo & White, 1972), it is important to recognize that the critical ingredients of naturalistic environments cannot always be captured in the lab. Thus, field studies and archival studies with nonstudent samples often serve as a good companion for lab studies because they provide real examples of the antecedents and consequences of prejudice. This point is illustrated by the following studies.

Since the Civil Rights Act of 1964, the impact of prejudice and stereotypes on judicial decisions has remained consistent but more subtle. Even though mock trials have been conducted using laboratory studies, such settings cannot completely capture the gravity of sentencing someone to years of jail time or to death. Imagining that a hypothetical defendant is going to spend years in jail or be put to death cannot be equated with actually being faced with the decision as a judge or jury member. Researchers have started turning to nonstudent samples and archival studies to examine the role of prejudice in the judicial system. Two studies utilized a database of incarcerated individuals in the Philadelphia corrections system to examine the impact of race on death penalty sentences (Baldus, Woodworth, Zuckerman, Weiner, & Broffitt, 1998; Eberhardt, Davies, Purdie-Vaughns, & Johnson, 2006). Both studies found that Black defendants were more likely to receive death penalty sentences compared to White defendants even after controlling for the type and severity of the crime. Moreover, defendants with more African facial features were more likely to receive the death penalty than others with more European facial features (Eberhardt et al., 2006). Blair, Judd, and Chapleau (2004) used a database of inmates in the Florida corrections system to examine the link between Afrocentric facial features and criminal sentences. Even after controlling for criminal histories, defendants with more prototypically African facial appearance received up to 8 months more jail time compared to defendants with less African appearance. In this case, using nonstudent data was important to examine how racial stereotypes influence actual judicial decisions that have real and serious consequences.

As with judicial decisions, employment decisions can be simulated in laboratory studies, but key ingredients in actual hiring situations may be missing in such simulations. For example, business professionals have

domain-specific knowledge and training that come into play when they make hiring decisions. These characteristics make them different from student participants. Because of this, some studies examining the influence of stereotypes on hiring decisions have paid attention to recruiting participants who are managers and business professionals in addition to students (Cesare, 1996; Eagly, Makhijani, & Klonsky, 1992) and others have conducted audit studies in which bogus resumes are mailed to real companies for real advertised jobs to examine the impact of race and gender on applicant ratings (Correll, Benard, & Paik, 2007; McIntyre, Moberg, & Posner, 1980). This is not to say that effects found with student samples are never comparable to nonstudent samples. Of course there is overlap in the psychological processes at work in both samples. However, comparing students to nonstudents is necessary to determine if training, expertise, and knowledge are sufficient to attenuate the impact of prejudice and stereotypes on hiring and promotions. Results show that in some cases business professionals exhibit bias similar to student participants. A meta-analysis by Eagly et al. (1992) found that both college students and business professionals show bias in their evaluation of women in leadership positions compared to their male counterparts. Other studies using business people as participants show that these individuals do not exhibit any gender bias (Lyness & Judiesch, 1999; Powell & Butterfield, 1994; Stroh, Brett, & Reilly, 1992). In sum, nonstudent samples are needed to spell out the conditions under which training, expertise, and knowledge do versus do not mitigate the impact of prejudice and stereotypes on employment decisions. This issue cannot easily be investigated with student samples because one cannot manipulate training, experience, and knowledge in a single lab session or even in multiple lab sessions. Business students are the most similar to business professionals; however, even such students clearly have not acquired the same amount of experience as long-term professionals.

When Do Student Samples Help the Scientific Study of Prejudice and Stereotyping?

Academic Environments May Contain Theoretically Interesting Variables

Because colleges and universities often strive to create diverse communities of students and faculty, these environments are likely to contain psychological variables that are important for prejudice reduction. For example, colleges and universities may have a higher proportion of disadvantaged group members in high-status counterstereotypic roles compared to noncollege settings (high-level faculty and administrators who are ethnic minorities or women). So too, education about diversity may have a consciousness raising effect and strengthen egalitarian values and intrinsic motivation to avoid prejudice. These special qualities of academic environments are of value to researchers who are interested in examining whether these variables play a critical role in undermining prejudice and stereotyping. Three examples illustrate our argument.

As a case in point, we conducted a longitudinal study investigating whether naturally existing differences between two types of colleges—a women's college vs. a coeducational college—influenced students' gender stereotypes after long-term immersion in these environments (Dasgupta & Asgari, 2004, Study 2). Because women's colleges typically have more women in leadership roles (as faculty, administrators, etc.) than comparable coeducational colleges, a comparison of these two types of institutions provided an ideal way to examine the impact of campus exposure to counterstereotypic women leaders on students' implicit gender stereotypes. To that end, we tracked implicit beliefs about gender and leadership in female students who were immersed in campus environments that had relatively few women in leadership roles (i.e., a coed college) versus relatively more women in leadership roles (i.e., a women's college). During the 1st year of college, students at both colleges expressed equivalent (and moderate) implicit gender stereotypes. However, by their sophomore year, students at the women's college expressed no implicit gender stereotypes, whereas their peers at the coeducational college expressed strong implicit gender stereotypes. Moreover, as predicted, greater exposure to women in leadership roles at the women's college compared to the coed college mediated implicit stereotype reduction over time. In sum, in this study we were able to take advantage of special qualities within college campuses to test a theoretically driven prediction that repeated exposure to counterstereotypes can undermine implicit bias.

College campuses routinely educate students about the benefits of diversity, both informally (outside the classroom) and formally (through coursework). Thus, they comprise ideal situations in which to empirically test whether education attenuates conscious and nonconscious prejudice against historically disadvantaged groups. This is what Rudman, Ashmore, and Gary (2001) set out to investigate in their study on racial attitudes. Rudman and colleagues measured students' implicit and explicit racial attitudes before and after they completed a course on prejudice and conflict resolution. Compared to students in a control course where the topic was not on prejudice, students in the prejudice seminar showed significantly less prejudice both explicitly and implicitly over time. Moreover, students in the prejudice seminar became more aware of and motivated to overcome their own biases, and reported feeling less threatened by outgroup members over time. Of course, the effect of education on prejudice reduction

could have been studied in a nonacademic setting using nonstudent participants; however, the academic environment was ideal because students were already motivated to learn.

Another cluster of psychological variables of interest to prejudice researchers is motivation to control prejudice and chronic egalitarian goals. Because students in North America are typically exposed to egalitarian values on campus (Lottes & Kuriloff, 1994), college campuses are likely to have sufficient numbers of participants with such goals and motives. Using student samples, several studies have found that the adoption of chronic egalitarian goals reduces automatic stereotype activation (Moskowitz, Gollwitzer, & Wasel, 1999; Moskowitz, Salomon, & Constance, 2000); and similarly, internal motivation to control prejudice reduces prejudice expression (Amodio, Harmon-Jones, & Devine, 2003; Devine, Plant, Amodio, Harmon-Jones, & Vance, 2002). Together, these lines of research suggest that socialization of egalitarian values promotes the reduction of both implicit and explicit prejudice. The advantage of using student samples in this case is not because these researchers assumed that the characteristics of college campuses will easily translate to nonacademic settings. Instead, by tapping students these researchers could access a large number of individuals who possessed the psychological characteristics of interest—internal motivation to avoid prejudice and chronic egalitarian goals. Now that student-based research has established that these two variables evoke prejudice reduction, one can investigate the same socialization forces in nonacademic settings.

Students Possess Theoretically Interesting Characteristics

When social psychologists are interested in developmental questions about the nature of prejudice (e.g., what critical mental processes produce changes in prejudice?) student samples can be particularly useful to the extent that the 18- to 22-year-old age group captures the developmental characteristics of interest. It is clear from developmental research that late adolescence/young adulthood differs from middle and late adulthood in several ways important for the understanding of prejudice. For example, adolescents and young adults show less crystallized attitudes compared to middle-aged and older adults; therefore attitudes change is more possible during this life stage (Hoge et al., 1993; Jennings & Markus, 1984; Perry, 1999). Moreover, higher education promotes the exploration and reconsideration of attitudes and beliefs during this developmental period (Pascarella & Terenzini, 1991). These findings suggest that prejudice reduction may be easier with college students than older adults, which is consistent with previously described evidence showing that intergroup contact evokes more prejudice reduction among students compared to older adults (Pettigrew & Tropp, 2006). To researchers who are particularly interested in developmental windows when attitudes are most malleable, focusing on student populations is ideal.

A second example where developmental processes have important implications for prejudice is the development of cognitive control. Studies on cognitive control across the life span typically find an inverted U-shaped function, with children, adolescents, and older adults showing significantly less ability to exert cognitive control compared to adults (Cepeda, Kramer, Gonzalez, & Sather, 2001; Zelazo, Craik, & Booth, 2004). Cognitive control plays a critical role in modulating the relationship between prejudice and discriminatory behavior such that when cognitive control is depleted, negative attitudes toward outgroups have the most impact on people's behavior (Dasgupta & Rivera, 2006; Gailliot et al., 2007; Govorun & Payne, 2006; Richeson et al., 2003; Richeson & Trawalter, 2005). For example, people show more race bias after experiencing cognitive depletion (Govorun & Payne, 2006). So too, individuals who have little ability to control their interpersonal behavior are more likely to act on their implicit prejudice compared to others who have more ability to control their behavior (Dasgupta & Rivera, 2006). Because students are located in the age group where the ability to exert cognitive control has not yet peaked, using student participants affords an ideal opportunity to investigate how variations in cognitive control brought about by situational manipulations and individual differences influence prejudicial attitudes and behavior. For researchers who are interested in asking questions about how basic mental processes such as cognitive control allow people to regulate attitudes and behavior, student samples provide an ideal window into that process.

Student Samples Provide an Efficient Means to Develop Theories Before Testing Their Generalizability in Broader Samples

Given the convenience of recruiting student participants, it often provides an efficient way to test initial hypotheses, build theories, and resolve concerns about internal validity and construct validity before attempting to generalize one's theory to broader samples or special populations. This strategy of starting small with student samples before moving on to more ambitious nonstudent samples to establish external validity has been successfully utilized by several programs of research. Here we offer three examples.

Motivated by events in the past few years in which police officers shot and killed unarmed African American suspects, several studies have examined

the impact of racial stereotypes on decisions to shoot potentially armed suspects in law enforcement simulations (Correll, Park, Judd, & Wittenbrink, 2002; Correll, Urland, & Ito, 2006). Initial studies investigating this hypothesis did not have access to special populations of police officers and instead used student participants. Results showed that student participants' simulated shooting responses were consistently biased if, under time pressure, they had to decide whether to shoot a Black or White person who was potentially armed (Correll et al., 2002; Plant, Peruche, & Butz, 2005). Participants were more likely to shoot an unarmed Black man compared to an unarmed White man; so too they were faster to shoot an armed Black man compared to an armed White man. These results begged the question: Do shooting decisions differ between students versus experts who have training in this kind of decision making? In other words, does training attenuate the impact of racial stereotypes on rapid decision making? To address this question Correll et al. (2007) compared students to police officers, a population with substantial training and expertise in law enforcement decision making. They found that even though police officers demonstrated greater overall accuracy and a more conservative shooting standard compared to students (i.e., they were less "trigger-happy"), officers still demonstrated significant race bias in their shooting decisions. Thus, the impact of racial stereotypes on behavior was first examined with a student sample and then extended to a special population. In addition, replicating the effect with a police sample demonstrated that variables such as training can mitigate the impact of stereotypes on rapid decisions.

A second example of developing a theoretical model using student participants and later extending it to special populations comes from literature on the relation between implicit prejudice and discriminatory behavior. In the past decade, growing empirical evidence has demonstrated that implicit prejudice and stereotypes toward various disadvantaged groups captured by simple reaction time tasks predict a host of discriminatory outcomes such as biased evaluations of individual members, biased hiring decisions, allocation of fewer financial resources to those individuals, nonverbal behavioral bias, etc. (for a review see Greenwald, Poehlman, Uhlmann, & Banaji, in press). Most of the research on this topic used convenient samples of students. However, lately, some researchers have begun to test the external validity of these ideas by examining if implicit prejudice in specific high-impact contexts such as hospitals affects doctors' medical decisions. Specifically, Green et al. (2007) tested whether physicians' implicit racial attitudes predict their clinical decisions about the type of medical intervention to recommend to Black and White patients with acute coronary syndromes (specifically thrombolysis recommendations). Medical residents in internal medicine and emergency medicine participated in a study where they evaluated a clinical vignette of a hypothetical patient (Black or White) who arrived at an emergency room with an acute coronary syndrome, after which participants completed a task measuring their implicit racial attitudes. Results showed that physicians who exhibited more implicit race preference for Whites over Blacks were significantly more likely to treat the White patient with thrombolysis (a higher quality treatment) but not the Black patient even though both presented identical symptoms. These results extend previous laboratory findings on implicit race bias using student samples to special adult participants in health care settings and illustrate that participants' expertise does not always erase race bias in decision making.

A final example of the process of theory development with student samples and later expansion to nonstudent samples comes from research on prejudice and compunction. Because negative stereotypes are well-learned, are routinized, and tend to activate automatically, even individuals who consciously endorse egalitarian attitudes may sometimes act in a prejudicial manner. The inconsistency between a person's spontaneous prejudicial response and his or her ideal desired response can lead to guilt and the motivation to inhibit future biases. Initial research on this topic was conducted with student participants (Devine, Monteith, Zuwerink, & Elliot, 1991; Monteith & Voils, 1998). For example, Devine et al. gave White undergraduate participants a list of five scenarios depicting potential interactions with African Americans (e.g., sitting next to an African American person on a bus). Participants indicated how they would actually respond and how they should ideally respond. When there was a discrepancy between actual and ideal responses, low prejudice participants reported feeling guilty and attempted to monitor and correct their future behavior more diligently. In an attempt to generalize the initial research with students, Voils, Ashburn-Nardo, and Monteith (2002) recruited nonstudent participants of various ages, income levels, and education levels. Voils and colleagues found the same pattern of results with adult nonstudents as they had with students. Even the magnitude of discrepancy between what participants reported they would do and what they should do was similar across students and nonstudents.

All three of these examples illustrate how a theoretical model can be developed and tested efficiently using student samples and later extended to a general adult population or to special populations of interest depending on the specific research question. The convenience of data collection with student participants provides an efficient way to refine a theoretical model and resolve concerns about internal validity before testing it more generally in labor intensive forums.

Conclusion

We support Henry's (this issue) argument that broadening the types of samples used to test social psychological theories can only benefit our understanding of the nature of prejudice and stereotyping by facilitating theory building and identifying boundary conditions that delimit existing theories. At the same time, we recognize several structural barriers that make it difficult for social psychologists to access adult samples and special populations even if they wish to do so. First, recruiting adults and special populations typically take considerable financial resources. Only rarely is it the case that one can recruit nonstudent adults to participate in psychological studies without compensation. Participant compensation is particularly important for experiments that require controlled settings rather than brief surveys that can be administered in any public setting. Compensation is also critical for any study (experiment or survey), that requires more than a few minutes of participants' time. Second, recruitment of nonstudent participants and special populations can be incredibly time-consuming even if one holds aside the issue of compensation. Given that our field rewards researchers who publish at a rapid and efficient clip, graduate students and early-career investigators may not have the flexibility to embark on studies that use nonstudent samples because of the long and uncertain time line for completion. Third, access to special populations and diverse adult samples requires planning, networking, and some luck to create the infrastructure necessary to produce a steady stream of participants. Access to special populations may also be limited by the geographical region in which the research is conducted. In sum, it is not easy to recruit nonstudent adults in the absence of professional networks and funding.

We offer some suggestions that may help mitigate these barriers to some degree. One strategy that we have used in our own work to offset the time-consuming process of recruiting adult participants is to initially test and refine our hypotheses and theories with convenience samples before venturing out to recruit nonstudent adults or to conduct field studies. Pairing studies that use student samples with other studies that use nonstudents is a way in which we have diversified our portfolio and minimizing research risk. Second, if we as a field recognize that diverse samples are critical to the development and revision of social psychological theories, we might consider rewarding investigators who actively use nonstudent participants to push the boundaries of their theories and ideas. As an example, grant proposals and empirical manuscripts that venture beyond student samples to test theoretically important questions using different participants could be rewarded for taking the risk to conduct innovative research. Reviewers may wish to place emphasis on theoretical innovations that emerge from (a) testing social psychological questions by comparing students to nonstudents, (b) generalizing initial findings with student participants to adults from diverse backgrounds and special populations, or (c) specifying the limits of a theory by showing that findings obtained from students fail to replicate in a different population. We as a field and we as individual investigators stand to enrich our understanding of the nature of prejudice and benefit social psychological theories if we expand the diversity of our participants.

Acknowledgments

We dedicate this article to William J. McGuire (1925–2007), whose writing and teaching had an enormous impact on the first author. She continues to benefit from his wisdom more than a decade after taking his graduate classes at Yale University.

Note

Address correspondence to Nilanjana Dasgupta or to Matthew Hunsinger, Department of Psychology, University of Massachusetts, Amherst, MA 01003. E-mail: dasgupta@psych.umass.edu; mhunsing@psych.umass.edu

References

Amodio, D. M., Harmon-Jones, E., & Devine, P. G. (2003). Individual differences in the activation and control of affective race bias as assessed by startle eyeblink response and self-report. *Journal of Personality and Social Psychology, 84*, 738–753.

Anderson, C. A., Lindsay, J. J., & Bushman, B. J. (1999). Research in the psychological laboratory: Truth or triviality? *Current Directions in Psychological Science, 8*, 3–9.

Baldus, D. C., Woodworth, G., Zuckerman, D., Weiner, N. A., & Broffitt, B. (1998). Racial discrimination and the death penalty in the post-Furman era: An empirical and legal overview, with recent findings from Philadelphia. *Cornell Law Review, 83*, 1638–1770.

Benjafield, J. G. (2005). *A history of psychology* (2nd ed). Boston: Allyn & Bacon.

Blair, I. V., Judd, C. M., & Chapleau, K. M. (2004). The influence of Afrocentric facial features in criminal sentencing. *Psychological Science, 15*, 674–679.

Bowen-Reid, T. L., & Harrell, J. P. (2002). Racist experiences and health outcomes: An examination of spirituality as a buffer. *Journal of Black Psychology, 28*, 18–36.

Campbell, D. T., & Stanley, J. C. (1967). *Experimental and quasi-experimental design for research*. Chicago: Rand McNally.

Cepeda, N. J., Kramer, A. F., & Gonzalez de Sather, J. C. M. (2001). Changes in executive control across the life span: Examination of task-switching performance. *Developmental Psychology, 37*, 715–730.

Cesare, S. J. (1996). Subjective judgment and the selection interview: A methodological review. *Public Personnel Management, 25*, 291–306.

Cole, S. W., Kemeny, M. E., & Taylor, S. E. (1997). Social identity and physical health: Accelerated HIV progression in

rejection-sensitive gay men. *Journal of Personality and Social Psychology, 72*, 320–335.

Correll, S. J., Benard, S., & Paik, I. (2007). Getting a job: Is there a motherhood penalty? *The American Journal of Sociology, 112*, 1297–1338.

Correll, J., Park, B., Judd, C. M., & Wittenbrink, B. (2002). The police officer's dilemma: Using ethnicity to disambiguate potentially threatening individuals. *Journal of Personality and Social Psychology, 83*, 1314–1329.

Correll, J., Urland, G. R., & Ito, T. A. (2006). Event-related potentials and decision to shoot: The role of threat perception and cognitive control. *Journal of Experimental Social Psychology, 42*, 120–128.

Correll, J., Wittenbrink, B., Park, B., Judd, C. M., Sadler, M. S., & Keesee, T. (2007). Across the thin blue line: Police officers and the racial bias in the decision to shoot. *Journal of Personality and Social Psychology, 92*, 1006–1023.

Cronbach, L. J. (1957). The two disciplines of scientific psychology. *American Psychologist, 12*, 671–684.

Dasgupta, N., & Asgari, S. (2004). Seeing is believing: Exposure to counterstereotypic women leaders and its effect on automatic gender stereotyping. *Journal of Experimental Social Psychology, 40*, 642–658.

Dasgupta, N., & Rivera, L. M. (2006). From automatic antigay prejudice to behavior: The moderating role of conscious beliefs about gender and behavioral control. *Journal of Personality and Social Psychology, 91*, 268–280.

Devine, P. G., Monteith, M. J., Zuwerink, J. R., & Elliot, A. J. (1991). Prejudice with and without compunction. *Journal of Personality and Social Psychology, 60*, 817–830.

Devine, P. G., Plant, E. A., Amodio, D. M., Harmon-Jones, E., & Vance, S. L. (2002). The regulation of explicit and implicit race bias: The role of motivations to respond without prejudice. *Journal of Personality and Social Psychology, 82*, 835–848.

Eagly, A. H., Makhijani, M. G., & Klonsky, B. G. (1992). Gender and the evaluation of leaders: A meta-analysis. *Psychological Bulletin, 111*, 3–22.

Eberhardt, J. L., Davies, P. G., Purdie-Vaughns, V. J., & Johnson, S. L. (2006). Looking deathworthy: Perceived stereotypicality of Black defendants predicts capital-sentencing outcomes. *Psychological Science, 15*, 383–386.

Fiske, S. T. (2004). *Social beings: Core motives in social psychology*. Hoboken, NJ: Wiley.

Finkel, D., Reynolds, C. A., McArdle, J. J., Gatz, M., & Pedersen, N. L. (2003). Latent growth curve analyses of accelerating decline in cognitive abilities in late adulthood. *Developmental Psychology, 39*, 535–550.

Gailliot, M. T., Baumeister, R. F., DeWall, C. N., Maner, J. K., Plant, E. A., Tice, D. M., Brewer, L. E., & Schmeichel, B. J. (2007). Self-control relies on glucose as a limited energy source: Willpower is more than a metaphor. *Journal of Personality and Social Psychology, 92*, 325–336.

Govorun, O., & Payne, B. K. (2006). Ego-depletion and prejudice: Separating automatic and controlled components. *Social Cognition, 24*, 111–136.

Green, A. R., Carney, D. R., Pallin, D. J., Ngo, L. H., Raymond, K. L., Iezzoni, L. I., et al. (2007). Implicit bias among physicians and its prediction of thrombolysis decisions for Black and White patients. *Journal of General Internal Medicine, 22*, 1231–1238.

Greenwald, A. G., Poehlman, T. A., Uhlmann, E., & Banaji, M. R. (in press). Understanding and Using the Implicit Association Test: III. Meta-analysis of Predictive Validity. *Journal of Personality and Social Psychology*.

Guyll, M., Matthews, K. A., & Bromberger, J. T. (2001). Discrimination and unfair treatment: Relationship to cardiovascular reactivity among African American and European American women. *Health Psychology, 20*, 315–325.

Hess, T. M., Auman, C., Colcombe, S. J., & Rahhal, T. A. (2003). The impact of stereotype threat on age differences in memory performance. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 58*, 3–11.

Hoge, D. R., Johnson, B., & Luidens, D. A. (1993). Determinants of church involvement of young adults who grew up in Presbyterian churches. *Journal of the Scientific Study of Religion, 32*, 242–255.

Jennings, M. K., & Markus, G. B. (1984). Partisan orientations over the long haul: Results from the three-wave political socialization panel study. *American Political Science Review, 78*, 1000–1018.

Klaczynski, P. A., Goold, K. W., & Mudry, J. J. (2004). Culture, obesity stereotypes, self-esteem, and the "thin ideal": A social identity perspective. *Journal of Youth and Adolescence, 33*, 307–317.

Krieger, N., & Sidney, S. (1996). Racial discrimination and blood pressure: The CARDIA study of young Black and White adults. *American Journal of Public Health, 86*, 1370–1378.

Levy, B. (2003). Mind matters: Cognitive and physical effects of aging self-stereotypes. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 58B*, 203–211.

Levy, B., Ashman, O., & Dror, I. (1999). To be or not to be: The effects of aging stereotypes on the will to live. *Journal of Death and Dying, 40*, 409–420.

Levy, B., Hausdorff, J. M., Hencke, R., & Wei, J. Y. (2000). Reducing cardiovascular stress with positive self-stereotypes of aging. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 55*, 205–213.

Lottes, I. L., & Kuriloff, P. J. (1994). The impact of college experience on political and social attitudes. *Sex Roles, 31*, 31–54.

Lyketsos, C. G., Chen, L., & Anthony, J. C. (1999). Cognitive decline in adulthood: An 11.5-year follow-up of the Baltimore epidemiologic catchment area study. *American Journal of Psychiatry, 156*, 58–65.

Lyness, K. S., & Judiesch, M. K. (1999). Are women more likely to be hired or promoted into management positions? *Journal of Vocational Behavior, 54*, 158–173.

McGuire, W. J. (1973). The yin and yang of progress in social psychology: Seven koan. *Journal of Personality and Social Psychology, 26*, 446–456.

McGuire, W. J. (2004a). A life in psychology: The human element. In J. T. Jost, M. R. Banaji, & D. A. Prentice (Eds.), *Perspectivism in social psychology: The yin and yang of scientific progress* (pp. 25–34). Washington, DC: American Psychological Association.

McGuire, W. J. (2004b). A perspectivist approach to theory construction. *Personality and Social Psychology Review, 8*, 173–182.

McIntyre, S., Moberg, D. J., & Posner, B. Z. (1980). Preferential treatment in preselection decisions according to sex and race. *Academy of Management Journal, 23*, 738–749.

Meyer, I. H. (1995). Minority stress and mental health in gay men. *Journal of Health and Social Behavior, 36*, 38–56.

Milgram, S. (1965). Some conditions of obedience and disobedience to authority. *Human Relations, 18*, 57–76.

Millard, J. (1995). Suicide and suicide attempts in the lesbian and gay community. *The Australian Journal of Mental Health and Nursing, 4*, 181–189.

Monteith, M. J., & Voils, C. I. (1998). Proneness to prejudiced responses: Toward understanding the authenticity of self-reported discrepancies. *Journal of Personality and Social Psychology, 75*, 901–916.

Mook, D. G. (1983). In defense of external invalidity. *American Psychologist, 38*, 379–387.

Moskowitz, G. B., Gollwitzer, P. M., & Wasel, W. Preconscious control of stereotype activation through chronic egalitarian goals. *Journal of Personality and Social Psychology, 77*, 167–184.

Moskowitz, G. B., Salomon, A. R., & Constance, M. (2000). Preconsciously controlling stereotyping: Implicitly activated egalitarian goals prevent the activation of stereotypes. *Social Cognition, 18*, 151–177.

Oyserman, D., Coon, H. M., Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin, 128*, 3–72.

Panayiotou, G., & Papageorgious, M. (2007). Depressed mood: The role of negative thoughts, self-consciousness, and sex role stereotypes. *International Journal of Psychology, 42*, 289–296.

Paradies, Y. (2006). A systematic review of empirical research on self-reported racism and health. *International Journal of Epidemiology, 35*, 888–901.

Pascarella, E., & Terenzini, P. (1991). *How college affects students: Findings and insights from twenty years of research*. San Francisco: Jossey-Bass.

Perry, W. G. (1999). *Forms of ethical and intellectual development in the college years: A scheme*. San Francisco: Jossey-Bass.

Peterson, B. E., Duncan, L. E., & Pang, J. S. (2002). Authoritarianism and political impoverishment: Deficits in knowledge and civic disinterest. *Political Psychology, 23*, 97–112.

Pettigrew, T. F. (1998). Intergroup contact theory. *Annual Review of Psychology, 49*, 65–85.

Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. *Journal of Personality and Social Psychology, 90*, 751–783.

Plant, E. A., Peruche, B. M., & Butz, D. A. (2005). Eliminating automatic racial bias: Making race non-diagnostic for responses to criminal suspects. *Journal of Experimental Social Psychology, 41*, 141–156.

Powell, G. N., & Butterfield, D. A. (1994). Investigating the "glass ceiling" phenomenon: An empirical study of contextual and cognitive approaches. *Academy of Management Review, 19*, 786–820.

Richeson, J. A., & Trawalter, S. (2005). African Americans' implicit racial attitudes and the depletion of executive function after interracial interactions. *Social Cognition, 23*, 336–352.

Robertson, A. (1998). The mental health experiences of gay men: A research study exploring gay men's health needs. *Journal of Psychiatric and Mental Health Nursing, 5*, 33–40.

Rudman, L. A., Ashmore, R. D., & Gary, M. L. (2001). "Unlearning" automatic biases: The malleability of implicit prejudice and stereotypes. *Journal of Personality and Social Psychology, 81*, 856–868.

Schmader, T., & Johns, M. (2003). Converging evidence that stereotype threat reduces working memory capacity. *Journal of Personality and Social Psychology, 85*, 440–452.

Shapiro, J. R., & Neuberg, S. L. (2007). From stereotype threat to stereotype threats: Implications of a multi-threat framework for causes, moderators, mediators, consequences, and interventions. *Personality and Social Psychology Review, 11*, 107–130.

Shelton, J. N., Richeson, J. A., & Salvatore, J. (2005). Expecting to be the target of prejudice: Implications for interethnic interactions. *Personality and Social Psychology Bulletin, 31*, 1189–1202.

Spencer, S. J., Steele, C. M., & Quinn, D. M. (1999). Stereotype threat and women's math performance. *Journal of Experimental Social Psychology, 35*, 4–28.

Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist, 52*, 613–629.

Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology, 69*, 797–811.

Steele, C. M., Spencer, S. J., & Aronson, J. (2002). Contending with group image: The psychology of stereotype and social identity threat. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 34, pp. 379–440). San Diego, CA: Academic.

Stroh, L. K., Brett, J. M., & Reilly, A. H. (1992). All the right stuff: A comparison of female and male managers' career progression. *Journal of Applied Psychology, 77*, 251–260.

Voils, C. I., Ashburn-Nardo, L., & Monteith, M. J. (2002). Evidence of prejudice-related conflict and associated affect beyond the college setting. *Group Processes and Intergroup Relations, 5*, 19–33.

Ward, L. M. (2004). Wading through the stereotypes: Positive and negative associations between media use and Black adolescents' conceptions of self. *Developmental Psychology, 40*, 284–294.

Wertheimer, M. (2000). *A brief history of psychology* (4th ed.). Belmont, CA: Wadsworth.

Williams, D. R. (1999). Race, socioeconomic status, and health: The added effects of racism and discrimination. *Annals of the New York Academy of Sciences, 896*, 173–188.

Zelazo, P. D., Craik, F. I. M., & Booth, L. (2004). Executive function across the life span. *Acta Psychologica, 115*(2–3), 167–183.

Zimbardo, P. G., & White, G. (1972). *Stanford Prison experiment slide-tape show*. Stanford University.