Using the Student Body: College and University Students as Research Subjects in the United States during the Twentieth Century

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IN April 1996, Nicole Wan, a nineteen-year-old undergraduate student from the University of Rochester, died of a heart attack after undergoing a bronchoscopy that was performed to collect cell tissue from her lungs. The autopsy indicated that the heart attack resulted from a fatal dose of lidocaine, a topical anesthetic. Wan was participating in a study of the effects of smoking and air pollution on the lungs sponsored by the National Institutes of Health, which paid students $150 for participating in the project. After Wan's death, the university suspended the study, and Wan's parents filed a multimillion dollar wrongful-death suit against the university hospital and the doctors involved in the research project. In October 1996, the Wans reached a settlement with the university, which included undisclosed financial terms, a full scholarship for Chinese-American students, and an annual lecture on the ethical and safety issues surrounding medical research.[1]

Fortunately, Wan's case is rare: thousands of students volunteer for human experiments every year without suffering permanent injury. Indeed, had Wan survived the procedure, her story would have attracted little if any notice. The use of students as research subjects

1. Paulette V. Walker, "University of Rochester suspends study after accidental death," *Chronicle of Higher Education*, 12 April 1996, p. A37; Lisa Guernsey, "University of Rochester sued for $100 million in student's death," *Chronicle of Higher Education*, 10 May 1996, p. A42; "Overdose lawsuit settled," *Newsday*, 3 October 1996, p. A28.

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has also received little attention from historians: although there has been a wealth of scholarship on both the ethics and the history of human experimentation, there has not been much work on the historical origin of and reasoning underlying the use of students in medical research.[2] In this article I explore how students were constructed as research subjects, how they were recruited into studies, and the kinds of projects into which they were enrolled. I will show that researchers used the student body for their studies not only because it was convenient, but also because they had certain beliefs about who made ideal research material.

The history of using students as subjects in scientific research is intimately connected to the history of human experimentation more generally. As Susan Lederer has demonstrated in her book *Subjected to Science*, "allegiance to scientific medicine and laboratory research became a source of professional legitimacy for American physicians" in the late nineteenth century, which led to a dramatic increase in the number of experiments involving both patients and volunteers.[3] The use of human beings in medical research did not arise without controversy, however. Antivivisectionist groups flourished in the late nineteenth and early twentieth centuries in response to horrific reports of the alleged mistreatment of animal and human subjects in medical experiments. The antivivisectionists were especially appalled by the use of orphaned children, prisoners, the feeble-minded, the poor, and other dependent populations as "clinical material." One way for medical reseachers to deflect criticism from antivivisectionists was to demonstrate a willingness to use themselves, their colleagues, and their students as research subjects. Lederer shows that self-experimentation enabled medical researchers to present themselves as "heroes and martyrs" to the cause of scientific advancement and thereby win public support for their endeavors. It was but a short step from experimentation on oneself to experimentation on medical students and graduate students in scientific laboratories. Medical and graduate students were an easily available and accessible source of subject material, who "did not require elaborate explanations of the goals,

2. Two notable exceptions are Susan Lederer, *Subjected to Science: Human Experimentation in America before the Second World War* (Baltimore, Md.: Johns Hopkins University Press, 1995) and Jonathan D. Moreno, "Convenient and captive populations," in Jeffrey P. Kahn, Anna C. Mastroianni, and Jeremy Sugarman, eds., *Beyond Consent: Seeking Justice in Research* (New York: Oxford University Press, 1998), pp. 111–30.

3. Lederer, (n. 2) *Subjected to Science*, pp. 1–2.

needs, and risks of the research. Individuals acquainted with laboratory technique could adjust more quickly to the demands of research apparatus. As educated participants, they could also provide more detailed and meaningful observations of their experiences."[4] Experimentation on animal and human subjects was also a central part of medical education by the late nineteenth century, and it was common for medical students to use themselves and their classmates as subjects. Medical educators believed that self-experimentation not only gave students a thorough education in the principles of scientific medicine, it also cultivated a spirit of heroic self-sacrifice that was essential to a successful career as a physician.[5]

It is not clear whether medical students shared this notion that they should be willing participants in medical experiments, nor is it clear how they felt about serving as guinea pigs as part of their course requirements. Published accounts of research involving medical students describe them as willing, even eager, human subjects. Critics of human experimentation focused on the most egregious cases of cruelty in the name of science, and did not consider whether the participation of medical student volunteers was truly voluntary. Certainly the potential for abuse of medical student subjects was there, particularly for those whose participation was mandated by course requirements. Yet this does not appear to have been a problem during the late nineteenth and early twentieth centuries.

It is even more difficult to uncover the origins of another category of student subjects, namely the use of undergraduate students in human experiments. Indeed, the assumption that undergraduates are natural research subjects is so deeply embedded in both the history of and present-day thinking on human experimentation that it is difficult to separate discussion of student subjects from that of other healthy volunteers. One area where use of undergraduate students is described at length is in research projects that were done in conjunction with college health and hygiene work. The history of using undergraduate students as research subjects is closely linked with the development of college health as a field. During much of the nine-

4. Ibid., p. 19.

5. Ibid., pp. 30, 54–55. For more on the role of human experimentation in medical education, see Edward C. Atwater, "'Squeezing mother nature': Experimental physiology in the United States before 1870," *Bull. Hist. Med.*, 1958, *52*, 313–35. For more on the history of self-experimentation, see Lawrence K. Altman, *Who Goes First? The Story of Self-Experimentation in Medicine* (New York: Random House, 1987).

teenth century, college health work came primarily from departments of physical education, some of which employed physicians as either directors or as full-time staff members. One of the major activities of these physical education departments, in addition to supervising exercise programs, was the collection of anthropometric data on students. Most colleges required students to have a complete physical examination upon admittance, and many made yearly examinations mandatory until graduation. Among the major results of these efforts were the infamous "posture pictures" collected at many elite men's and women's colleges around the country. The practice of photographing students in the nude started in the late nineteenth century, and continued well into the 1970s. The original purpose of these photographs was to assess the physical health of students at admission, since many believed that poor posture was a sign of illness, particularly tuberculosis. Students were photographed every year to demonstrate the positive impact of physical education programs and other preventive health measures in college.[6]

Physicians soon realized that these data could do more than demonstrate the effectiveness of physical education programs: they could also be used to show the physical superiority of young people from the white, native-born, upper-middle classes. As several historians have demonstrated, concerns about race suicide and racial degeneration were rampant in late nineteenth- and early twentieth-century America and were intimately tied with the young nation's ambitions as an imperial power. College women were at the center of these anxieties about racial degeneration because female college graduates had fewer children than those who did not go to college and because it was believed that excessive studying could lead to physical decline in both men and women.[7] Concerns about race suicide and racial degeneration were also apparent in discussions about the health of college men and prompted many men's colleges and coeducational

6. Ruth Boynton, "Historical development of college health services," *Student Medicine*, 1962, *10*, 294–305; Ron Rosenbaum, "The Great Ivy League nude posture photo scandal," *New York Times Magazine*, 15 January 1993, pp. 26–31, 40, 46, 55–56. For more on the history of tuberculosis prevention programs in colleges and universities, see Heather Munro Prescott, "The white plague goes to college: Tuberculosis prevention programs in colleges and universities, 1920–1960," *Bull. Hist. Med.*, 2000, *74*, 735–72.

7. Gail Bederman, *Manliness and Civilization: A Cultural History of Gender and Race in the United States, 1880–1917* (Chicago: University of Chicago Press, 1995); Richard Hofstader, *Social Darwinism in American Thought* (Boston: Beacon Press, 1955).

universities to create departments of physical education beginning in the 1880s. Larry Owens has demonstrated how the development of physical education at colleges and universities was part of the nineteenth century "search for order," a strategy "adopted by Northern elites to help them maintain status, preserve culture, and reconcile the centrifugal forces that threatened the nation" after the Civil War.[8] In a recent article on the history of posture, David Yosifon and Peter Stearns have suggested a similar hypothesis and demonstrated how, in the nineteenth century, proper posture "constituted a demonstration of good character," a "mastery over physical weakness," and "growing attention to hygiene and to sexual restraint," all of which were characteristics associated with the emerging middle class. Yosifon and Stearns show that there was a racial component to this preoccupation with posture as well: bad posture was associated with lower species and the "less civilized races of men." Therefore, the "posture wars" at institutions of higher education represented a "distinctive kind of body control for the middle and upper classes," as well as those who aspired to such status.[9]

College physicians attempted to quell fears about race suicide by arguing that white, native-born American youth were actually larger, heavier, and healthier than those from other races and nations. To illustrate this point, R. Tait McKenzie of the University of Pennsylvania and Dudley Allen Sargent of Harvard University used measurements collected during mandatory physical examinations of students to construct statues of ideal male and female forms. Prominently displayed in the anthropology building at the Chicago World's Columbian Exposition in 1893, these statues were used to illustrate the racial superiority of the native-born, white upper classes.[10] The student body, therefore, became an exemplar for the bodily perfection of the dominant social class.

During the 1910s and 1920s, the professionalization of college

8. Larry Owens, "Pure and sound government: Laboratories, playing fields, and gymnasia in the nineteenth-century search for order," *Isis*, 1985, *76*, 182–194, p. 186.

9. David Yosifon and Peter N. Stearns, "The rise and fall of American posture," *Am Hist. Rev.*, 1998, *103*, 1057–95, pp. 1059, 1061, 1067.

10. Robert W. Rydell, *All the World's a Fair: Visions of Empire at American International Expositions, 1876–1916* (Chicago: University of Chicago Press, 1984), p. 57; Jacqueline Urla and Alan C. Swedlund, "The anthropometry of Barbie: Unsettling ideals of the feminine body in popular culture," in Jennifer Terry and Jacqueline Urla, eds., *Deviant Bodies* (Bloomington: Indiana University Press, 1995), pp. 288–89.

health created new demands for research on the student body. Warren Forsythe, director of the University Health Service at the University of Michigan, observed that health services at American colleges and universities were in the process of evolving from an early "gymnastic period," which emphasized physical education and anthropometry, to a "period of health promotion," which fused curative medicine, public health, physical education, and hygiene teaching under a single university health department headed by medical doctors.[11] College physicians supported exercise programs for students, but they also argued that college health programs should emulate broader trends in scientific medicine by establishing infirmaries, clinics, and laboratories, and by having medical doctors be the ones who were primarily responsible for student health. The growing cultural authority of allopathic scientific medicine in the early twentieth century helped legitimize the notion that medical doctors, not physical educators, should control college health programs. Physical educators in the late nineteenth century usually had medical degrees, but by the early twentieth century it was becoming more common for physical educators to receive their training in departments of physical education at state universities and normal schools. College physicians argued that by virtue of their medical training, they were the ones most qualified to oversee the health of the student body. Sundwall claimed that it was all too common for colleges and universities to appoint as directors of health departments a "successful football coach" who was "ignorant of the sciences and interests which make up modern medicine and hygiene," and who supported a variety of health "fads" such as Fletcherism, vegetarianism, or hydrotherapy.[12] College physicians argued that by appointing allopathic physicians as directors of college health departments, institutions of higher education could help stamp out health quackery once and for all.

To further separate themselves from physical education and athletics, college physicians created the American Student Health Association (ASHA) in 1920. Physical educators, coaches, and athletic directors were allowed to participate in the organization, but physicians

11. Warren E. Forsythe, *Health Service in American Colleges and Universities* (University of Michigan, 1926), pp. 12–14.

12. John Sundwall, "The teaching of college hygiene," *Am. J. Public Health*, 1927, *17*, 48–57, p. 49.

in the organization were adamant about making a distinction between their work as medical professionals and that of physical educators and coaches. The ASHA's executive secretary, Dr. Ruth Boynton, wrote that while the organization allowed "any health service, department of physical education, or other organization of any educational institution which, in the opinion of the Executive Committee, is directly interested in the health of its students" to join, its main purpose was to encourage member institutions to increase the availability of medical services to its students.[13]

Emphasizing medical research was one of the main strategies used by college physicians to upgrade their field. Harold S. Diehl, director of student health at the University of Minnesota, argued that pursuit of medical research by health center staff "will engender in them a scientific spirit, it will stimulate scholarship and will prevent the day's work from becoming routine and monotonous . . . the health service, whose staff members are carrying on some research studies, will be more progressive and will render a higher type of service to its students than the one whose staff is occupied solely by the usual duties of the department." Diehl claimed that students made ideal research material because they were handy and because they represented a "fair sampling of the better portion of our population." Most important, college students were usually "glad to cooperate" and "intelligently interested in the studies which we are making."[14] R. W. Bradshaw of Oberlin College added that the college environment was the ideal laboratory, in which

> one may study the effects upon carefully selected and easily controllable material of propositions germinated in each of the sciences concerned with health . . . There is no other large group of people who can be so well moulded into an experiment as the average college student body. . . . They are intelligent and cooperative. Our observations may be carefully made and accurately checked. With the inauguration of the personnel work in our colleges we have placed at our disposal an array of pertinent facts concerning each individual never before assembled.[15]

13. R. Boynton to O. F. Hedley, Heart Disease Investigations, U.S. Public Health Service, 29 November 1937, *American Student Health Association Records*, SC 146, Stanford University Archives, Stanford, California (hereafter referred to as *ASHA Records*), Box 7, Folder 2.

14. H. S. Diehl, "Research opportunities in student health work," *Proc. Annu. Meet. Am. Stud. Health Assoc.*, 1927, *8*, 68–82, pp. 69–70.

15. R. W. Bradshaw, "Research in student health," *Am. J. Public Health* 1929, *19*, 1229–34, p. 1233.

To facilitate their involvement in medical research, college physicians affiliated themselves with local hospitals and medical schools. Frequently a college physician would have an appointment in a clinical department at universities with medical schools. This meant that college students were not only recruited for the research projects of college physicians, but were seen as potential research material for the entire medical faculty. College health centers also collaborated with other university departments that performed research on human subjects, including departments of psychology, anthropology, biology, and sociology. College physicians justified using students as material for a variety of faculty research projects by claiming that doing so would help researchers work out problems "which *directly* affect their present and future health, and their usefulness to the world." Serving as volunteers for medical research would also give students a "more scientific attitude toward disease," an "experienced discriminating judgment in the selection of scientific health advisors, services, and consultants," and a greater appreciation for medicine's dispassionate search for scientific truth.[16]

Yet students were not always swayed by appeals to altruism or the advancement of knowledge, and researchers frequently needed to provide additional incentives to get students to participate in research. Financial and academic rewards were the most frequent methods researchers used to entice students to subject their bodies to medical research. Susan Lederer has shown that "paying human subjects for their participation in research and for their bodily fluids became routine in the 1920s and 1930s."[17] College students were no exception. By the 1920s students found it easy to earn money for college by selling their blood and by serving as medical subjects. During the Great Depression, the financial incentive to participate in medical research became even more enticing. Researchers typically recruited students through advertisements in student newspapers and through college and university financial aid offices. It was also common for researchers to require students from undergraduate and medical school classes to participate in research projects or to offer them extra credit for doing so.[18]

16. Ibid., p. 1230.

17. Lederer, (n. 2) *Subjected to Science*, p. 119.

18. Ibid., pp. 119–20. For examples of articles describing this phenomenon, see "College youth not as painted: No sacrifice too great for cause of learning," *Los Angeles Times* 10 January 1927, Section II, p. 1; "Many students offer blood," *San Francisco Chronicle* 9 March 1933, p. 10. I am grateful to Susan Lederer for sharing these clippings with me.

Because college health centers spent much of their time treating students who were ill, many of the studies of college students were aimed at control and prevention of infectious diseases. During the 1920s and 1930s, college physicians did numerous studies of the effectiveness of vaccines and other treatments against such common childhood diseases as diphtheria, measles, and scarlet fever.[19] Tuberculosis was by far the most serious public health problem for college students: despite their relatively privileged status, college students had a higher average infection rate than did the general population. Tuberculosis was also one of the leading causes of death in college students. Numerous studies of college and university students conducted during the 1920s and early 1930s reported that the rate of infection with tuberculosis as determined by tuberculin skin tests was as high as 50 or 60 percent among undergraduates in colleges and universities in the northeastern United States, and as high as 80 percent among students in the Southwest. Infection rates were even higher in medical and nursing students, with some schools reporting that it was not unusual for the entire graduating class to test positive for tuberculosis.[20] The need to control tuberculosis compelled many college health centers to institute mandatory testing of all incoming students. Although these programs were created mainly to protect

19. Margaret Beattie and Eugenia Herron, "Determining carriers of B. diphtheriae," *Am. J. Public Health*, 1926, *16*, 710–13; H. S. Diehl, "Results of the Schick test at the University of Minnesota," *Minn. Med.*, 1926, *9*, 518; Frank L. Kelly, "Results of Schick tests in California," *Public Health Rep.*, 4 December 1925, *40*, 2645–63; H. D. Lees, "The Dick test, with active and passive immunization for scarlet fever," *J. Am. Med. Assoc.*, 1927, *88*, 1133–35; Robert T. Legge, "Status of vaccination in American colleges," *Public Health Rep.*, 22 May 1925, *40*, 1037–41; W. P. Shepard and H. S. Diehl, "Studies of the epidemiology of scarlet fever in a school outbreak," *J. Infect. Dis.*, 1923, *33*, 75; Stanley Thomas and R. C. Bull, "The pressure vaccination technic," *J. Am. Med. Assoc.*, 1927, *88*, 1879–81; Stanley Thomas, "Smallpox vaccination as carried out at Lehigh University," *Public Health Rep.*, 8 January 1926, *41*, 37–43; B. White, "Group reactions to the Schick test," *Boston Med. Surg. J.*, 1923, *189*, 1026.

20. Esmond R. Long and Florence Seibert, "The incidence of tuberculosis infection in American college students," *J. Am. Med. Assoc.*, 1937, *108*, 1761–765; E. R. Long, "Tuberculosis in college students, with special reference to tuberculin testing," *J. Lancet*, 1935, *55*, 201–3; J. Arthur Meyers, "Types of tuberculosis lesions found in the chests of students of nursing and medicine," *Am. Rev. Tuberc.*, 1933, *28*, 93–117. For more on general infection rates at this time, see Barbara Bates, *Bargaining for Life: A Social History of Tuberculosis, 1876–1938* (Philadelphia: University of Pennsylvania Press, 1992) and Georgina D. Feldberg, *Disease and Class: Tuberculosis and the Shaping of North American Society* (New Brunswick, N.J.: Rutgers University Press, 1995).

students from infection, tuberculosis prevention efforts also gave college physicians the opportunity to try out new diagnostic tests and control measures.[21]

College students also provided convenient material for testing substances that might be detrimental to their health, including alcohol, caffeine, and tobacco.[22] Physicians focused much of their attention on the effects of smoking, since the rate of smoking among college students, particularly women, had increased dramatically between 1900 and the 1920s. Some of the earliest research on the potential health risks of smoking used high school and college students. Most of these were epidemiological studies that examined the incidence of health problems among those who were already smokers. Others consisted of controlled experiments in which subjects smoked in the laboratory and then submitted to a variety of physiological and psychological tests, including the impact of smoking on mental efficiency, blood pressure, and pulse rate. Despite concerns about growing rates of smoking among women, female students were excluded from these types of experiments because researchers wanted to avoid conflicts with parents who feared their daughters might be lured into "undesirable practices."[23] These smoking studies did reveal several shortcomings of using college students as subjects: unlike captive populations such as prisoners and orphans, it was difficult to control students' lives outside the laboratory. For this reason, researchers often stated a preference for nonsmokers, who they assumed would be sure to follow instructions not to smoke before coming to the laboratory. It was also more difficult to administer tests using control substances such as warm air because, as researchers put it, students were more difficult to deceive than other subjects.[24]

21. Prescott, (n. 7).

22. Warren P. Lombard, "Some of the influences which affect the power of voluntary muscular contraction," *J. Physiol.* (London), 1892, *13*, 1–58; W. H. R. Rivers, *The Influence of Alcohol and Other Drugs on Fatigue* (London: E. Arnold, 1908).

23. M. V. O'Shea, *Tobacco and Mental Efficiency* (New York: Macmillan, 1923), p. xvi.

24. Ibid.; David June Carver, "The immediate psychological effects of tobacco smoking," *Comp. Psychol.*, 1922, *2*, 279–302; Robert Lee Bates, "The effects of cigar and cigarette smoking on certain psychological and physiological functions," *Comp. Psychol.*, 1922, *2*, 431–503; Rosslyn Earp, "Tobacco and scholarship," *Sci. Mon.*, 1928, *26*, 335–36; E. L. Clarke, "Effect of smoking on Clark College students," *Clark College Record* 1909, *4*, 3191–98; G. L. Meylan, "The effect of smoking on college students," *Pop. Sci.* Monthly, 1910, *77*, 169–78; Clarke L. Hull, "The influence of tobacco smoking on mental and motor efficiency," *Psychological Monographs*, 1924, *33*. For more on early studies of smoking, see Allan Brandt, "The cigarette, risk, and American culture," *Daedalus*, 1990, *119*, 155–73.

Professional conflicts with physical educators and athletics departments led college physicians to focus much of their attention on the relative health benefits of physical education and athletic competition. Physicians were hoping to use this information to redirect funds from well-endowed athletic programs to cash-starved college health centers. They also were concerned about high rates of injury and death among college athletes, as well as the fact that athletic competition only benefited a small portion of the student body. College physicians who hoped to demonstrate that athletics programs were detrimental to student health were disappointed: most studies found that there was no significant difference between the health of athletes and that of students who did not participate in competitive sports. However, these studies did show the fallacy of the assumption that athletes necessarily enjoyed better health and longer lives than did nonathletes. One study conducted by Louis I. Dublin for the Metropolitan Life Insurance Company showed that some athletes, particularly those with large builds, were more likely to become overweight later in life and therefore had higher rates of death from heart disease. Another study of the longevity of Yale athletes indicated athletes "are the type of men who, being full of physical energy are naturally courageous and expose themselves to danger both in war and at peace." Athletes were therefore more apt to die young from accidents than their more sedentary counterparts.[25]

Physicians were also interested in exerting more influence over physical education departments and were especially critical of physical education programs that they claimed were unscientific because they had not demonstrated the relationship between exercise and health through carefully controlled experiments. Diehl, for example, complained that many physical education programs were "continued year

25. L. I. Dublin, "Longevity of college athletes," *Harper's Monthly Magazine*, July 1928, 229–38; James C. Greenway, Ira V. Hiscock, et. al., "Mortality among Yale men," *Yale Alumni Weekly*, 11 June 1926, 1086–88, p. 1087. See also W. G. Anderson, "Further studies in the longevity of Yale athletes," *Medical Times*, 1916, *44*, 75; H. Brooks, "The effects of college athletics on after life," *The American Practitioner and News*, 1912, *46*, 573–77; Warren E. Forsythe, "Health and athletics," *J. Am. Med. Assoc.*, 1917, *68*, 995; W. H. Geer, "Life expectancy of college athletes," *Mind and Body*, 1924, *30*, 453–59; C. E. Hammett, "How basketball affects college men," *Am. Phys. Educ. Rev.*, 1928, *23*, 309–16; Roger I. Lee, "The effect of athletics on the heart: The athletic heart," *Am. Phys. Educ. Rev.*, 1917, *22*, 166–69; W. S. Middleton, "The effect of athletic training on the heart," *Am. Phys. Educ. Rev.*, 1915, *20*, 148–63; A. E. Parker, "Training for athletics and health," *Hygeia*, 1933, *11*, 17–20, 144–47, 242–46, 343–46.

after year primarily because they have always been done," not because they had demonstrated any health benefit. Diehl had "no doubt but that physical education, particularly of certain types, has definite values for most individuals," but added that physicians should "attempt to measure these values and extend those which prove real."[26]

Students were also used to establish what Diehl referred to as "standards of normality" for both students and the population more generally.[27] In fact, despite college physicians' attempts to distinguish their work from physical education and athletics, anthropometric studies of physical characteristics continued to form a significant portion of physicians' research on college students. This ongoing interest in measuring student bodies was part of a more general trend toward standardization in the early twentieth century. Inspired by the work of the Belgian statistician Lambert A. J. Quetelet and the creation of interchangeable parts and international measurements in science and industry, interest in creating ideal standards for the human body sprang from numerous quarters in early twentieth-century America. The industrialist Frederick Winslow Taylor's attempts to standardize all aspects of the workplace, including the workers, the need to develop standard sizes for the ready-to-wear clothing industry, and the emerging field of life insurance and the apparent link between height, weight, and health all contributed to a growing tendency to see the human body in terms of statistical averages established through rigorous scientific investigation. As Jacqueline Urla and Alan C. Swedlund observe in their history of anthropometry, "what began as statistical averages soon became a means of setting ideal norms." Actuarial tables on average heights and weights were distributed to doctors' offices and published in popular magazines, thereby "popularizing the notion that the human figure could be standardized and that abstract and often unrealistic norms could be uniformly applied."[28]

Again, students were seen as a convenient source for defining normal or ideal bodies. Between 1900 and the time of the Second World War, college health departments collected data on thousands of students. What set these studies apart from earlier anthropometric

26. Diehl, (n. 14), p. 79.
27. Ibid, p. 76.
28. Urla and Swedlund, (n. 10), p. 289.

data was the inclusion of state university students, some of whom were second- or third-generation immigrants. Some researchers continued to focus on "old stock" Americans who could trace their ancestry to the early years of English settlement, while others began to explore the possibility that intermarriage between "old" Americans and more recent immigrants had created a "new" American type that was superior both to older generations of Americans and to Europeans who remained in their countries of origin.[29]

One of the major findings of these studies was that the average heights and weights of college students had grown considerably since the late nineteenth century. Even the studies of second- or third-generation immigrants showed that these students were substantially larger than their counterparts in Europe. Reactions to these results were mixed and reflected a more general ambivalence about the racial and ethnic composition of the United States in the interwar years. Some researchers saw the growth of college students as evidence of the superiority of both the American environment and racial stock. Survival of the most fit individuals from native-born and immigrant groups, combined with improvements in nutrition and health care, had led to drastic improvements in the bodies of American college students.[30]

Others were more cautious: Earnest Albert Hooton of the Harvard anthropology department, for example, warned "there is reason to doubt that increase in size has brought better health and more hardihood to our youth." Hooton argued that intermarriage between immigrants and "old stock" Americans, like crossbreeding of domesticated animals and plants, may lead to "hybrid offspring" who are larger and seemingly more vigorous than their parents are. "However, this hybrid vigor usually diminishes in succeeding generations of the mixed breeds." Hooton warned that bigger bodies were not necessarily better: if growth in height was not accompanied by corresponding growth in weight and muscle, then the result was a "bean pole" who

29. Harry L. Shapiro, "A portrait of the American people," *Natural History*, June 1945, 248–55.

30. Gordon T. Bowles, *New Types of Old Americans at Harvard and at Eastern Women's Colleges* (Cambridge, Mass.: Harvard University Press, 1932); Clelia Duel Mosher, "Concerning the size of women: Preliminary note with special reference to height," *Calif. State J. Med.*, 1921, *19*, 53–54; Faith Fairfield Gordon, "Physical measurements of one thousand Smith students," *Am. J. Public Health*, 1930, *20*, 963–68.

was "probably weaker" and more vulnerable to diseases "than the stockier men of previous generations."[31] One of Hooton's graduate students, Gordon Townsend Bowles, found that "despite the advantage of increased stature and weight, these increases are offset to a degree by the decrease in chest expansion and the decrease, especially in the female, of pelvic breadth." Bowles suggested that these trends may have been partly responsible for the declining birth rate among female college graduates, as well the increased proportion of heart diseases "caused by the taxing of the heart muscles in earlier life."[32]

Research on students soon extended beyond studies of body build, as college physicians and other scientists used college students to establish other standards of normality. Physicians used students to explore the normal ranges for blood pressure, lung capacity, pulse rate, basal metabolism, and other physiological processes.[33] Other studies were aimed at discerning the causes of heart disease, kidney failure, cancer, stroke, mental illness, and other debilitating conditions that appeared later in life. One of the major rationales that college physicians used to justify their participation in research was to search for solutions to the health disasters of mid-life and old age. Thomas Storey of Stanford University, for example, argued that "one cannot escape the belief that the thousands of college boys and girls now under observation are constantly giving us signs we cannot see and information we do not understand, and that with scientific imagination and patient research we will slowly acquire new knowledge and technique that will enable us to recognize and decipher their symptom codes that now vainly call our attention to distant, approaching poor health."[34] Before the Second World War, however, few college health

31. Earnest Albert Hooton, "We Are Getting Taller," *Good Housekeeping*, 1946, *122*, 141–42.

32. Bowles, (n. 30) *New Types*, pp. 141–42.

33. W. C. Alvarez, "Blood pressure in 15,000 university freshmen," *Arch. Intern. Med.*, 1923, *32*, 17–30; W. C. Alvarez, R. L. McCalla, and A. Zimmerman. "Hypertension and constipation," *Arch. Intern. Med.*, 1926, *38*, 158–66; H. S. Diehl and K. H. Sutherland, "Systolic blood pressures in young men, including a special study of those with hypertension," *Arch. Intern. Med.*, 1925, *36*, 151–73; Roger I. Lee, "Blood pressure determinations, urinary findings and differential blood counts in a group of 662 young male adults," *Boston Med. Surg. J.*, 1915, *173*, 541–43; D. C. Parmenter, "Occurrence and significance of systolic murmurs in healthy individuals." *J. Am. Med. Assoc.*, 1920, *88*, 1680; W. P. Shepard and J. A. Myers, "The respiratory organs in health and in disease," *Arch. Intern. Med.*, 1925, *35*, 337–46.

34. Thomas Storey, "Periodic health examinations as a means of research," *Proc. Annu. Meet. Am. Stud. Health Assoc.*, 1927, *8*, 51–59, p. 53.

centers had the time or resources to analyze the massive amount of data collected in periodic health examinations of students, and much of this information went unused for decades.

Another area in which students were used to establish standards of normality was in the field of clinical psychology. By the late nineteenth century, original research became an important component of the professional development of psychology as an academic field. As Roderick D. Buchanan writes in a historical study of the Minnesota Multiphasic Personality Inventory, laboratory research aimed at developing standardized psychological tests played a decisive role in establishing psychology as a legitimate scientific discipline in the late nineteenth and early twentieth centuries.[35] The creation of physical and mental psychological tests depended heavily on the establishment of normal parameters of human sensory and motor skills as well as human intelligence. Research universities throughout the country, including elite universities such as Columbia, Pennsylvania, Princeton, Clark, Vassar, and Stanford, as well as state universities such as Wisconsin and Iowa, created laboratories and departments to explore human psychology. Psychological researchers took it for granted that students in undergraduate and graduate courses in psychology, as well as students recruited from the general student body, were a natural source of subjects for psychology laboratories. They also assumed that students, by virtue of their class and education, were the best able to represent normal responses to psychological tests. In 1895, the American Psychological Association appointed a Committee on Physical and Mental Tests chaired by James McKeen Cattell from Columbia to oversee the various studies of human psychology that used college students as subjects. Psychological studies on college students helped create a baseline of "normal" human responses to a number of well-known psychological tests, including the Minnesota Multiphasic Personality Inventory, the Thematic Apperception Test, the Rorschach test, and various tests measuring human intelligence and scholastic aptitude.[36]

The work of researchers in clinical psychology fit well with the

35. Roderick D. Buchanan, "The development of the Minnesota Multiphasic Personality Inventory," *J. Hist. Behav. Sci.*, 1994, *30*, 148–61.

36. Robert A. Brotemarkle, "College student personnel work," in Robert A. Brotemarkle, ed., *Clinical Psychology: Studies in Honor of Lightner Witmer* (Philadelphia: University of Pennsylvania Press, 1931), pp. 103–4.

interests of admissions officers at elite colleges and universities during the early twentieth century. As David O. Levine observes in his history of American colleges in the first half of the twentieth century, during the years after World War I, college education became more attractive to a wider cross-section of the American population, who believed that higher education was essential to economic and social mobility. In response to this growing wave of aspiring college students, elite colleges sought ways to limit their enrollments to the most academically gifted from a national pool of applicants. College administrators claimed that they were attempting to make college admissions more meritocratic by focusing on intellectual ability rather than on family connections. In reality, elite schools in the 1920s "sought deliberately to become bastions of the Protestant upper middle class and to confine their student bodies to young men from socially desirable socioeconomic backgrounds."[37] To weed out undesirable social groups, particularly Jews, college admissions officers relied on newly developed tests of intelligence and scholastic aptitude that were developed by psychological laboratories at this time. Yet these tests alone were not enough to eliminate socially undesirable applicants: indeed, much to their dismay, admissions officers found that Jewish students tended, on average, to excel at admissions tests and other measures of scholastic aptitude.[38]

Furthermore, admissions directors and others claimed that aptitude tests alone did not predict success in college. During the 1920s and 1930s, physicians in college health services called attention to a disturbing trend: increasing numbers of apparently bright students were dropping out because of emotional difficulties. A previous generation would have dismissed these academic casualties as representatives of an inferior grade of student, but by the 1920s, many of those involved in student health services and student personnel work were inspired by the mental hygiene movement of this period and became interested in finding ways to prevent and treat mental disturbances in college students before they led to academic difficulties and failure. Student health services frequently worked in conjunction with departments of clinical psychology to study the incidence of emotional difficulty

37. David O. Levine, *The American College and the Culture of Aspiration, 1915–1940* (Ithaca, N.Y.: Cornell University Press, 1986), p. 136.

38. Nicolas Lemann, *The Big Test: The Secret History of American Meritocracy* (New York: Farrar, Straus, and Giroux, 1999).

among the student body, as well as to design tests that would help predict which students would be most likely to experience maladjustments while in college.[39]

One of the best-known investigations in this area was the Grant Study of Social Adjustments (called the Grant Study for short because it was the first project funded by the William T. Grant Foundation), a project begun at Harvard University in 1937 by Hygiene Department director Arlie Bock. Concerned about having to deal "almost daily" with students "who were unhappy and badly adjusted to their environment," Bock proposed that he and the hygiene department start an interdisciplinary study of normal young men that would be used to improve medical, psychological, and vocational guidance services for this age group.[40] Bock's proposal soon attracted the attention of William T. Grant, founder and owner of a lucrative chain of five-and-dime stores and a former patient of Bock's, who had just established a foundation dedicated to "helping people or peoples to live more contentedly and peacefully and well in body and mind through a better knowledge of how to use and enjoy all the good things that the world has to offer them."[41] Like Bock, Grant was puzzled by psychological troubles and career failures of "normal, at times even highly promising persons" who worked for him, and he wanted a fool-proof method of selecting successful managers and salesmen for his company.[42] After several meetings with Bock during the summer and fall of 1937, Grant agreed to give the Harvard Hygiene Department $60,000 per year for five years to fund the study.[43]

Employing the circular logic typical of many definitions of "normal" subjects at this time, Bock and his colleagues assumed that

39. Brotemarkle, (n. 36), pp. 102–15. For an overview of mental hygiene and college students, see Sol Cohen, "The mental hygiene movement and the development of personality: Changing conceptions of the American college and university, 1920–1940," *History of Higher Education Annual*, 1982, *2*, 65–101; Kathleen W. Jones, "Mental hygiene goes to college," Paper presented at the History of Childhood Conference, Washington, D.C., 4–6 August 2000.

40. Arlie V. Bock, "A proposed study of unhappiness and maladjustment, using young men in Harvard University as a laboratory," typescript dated September, 1937, Grant Foundation Papers, Special Collections, Milbank Memorial Library, Teachers College, Columbia University, New York, (hereafter referred to as Grant Foundation Papers), Box 81.

41. Quoted in Emily Davis Cahan, *The William T. Grant Foundation: The First Fifty Years, 1936–1986* (New York: William T. Grant Foundation, 1986), p. 10.

42. Quoted in *Annual Report*, Grant Foundation, New York, 1992, pp. 8–9.

43. Eva Milofsky, "The Grant study: A panoramic view after half a century," unpublished typescript, Grant Foundation Papers, Box 77.

Harvard students were the best representatives of normality by virtue of their race, class, and gender. Harvard anthropologist Hooton put it most bluntly in "*Young Man, You Are Normal*," a popular book on the Grant Study, claiming that "it would be foolish to include Negro babies and inmates of a home for old men, with Radcliffe seniors" in a study of normal human development.[44]

To determine the qualities of normal, successful young men, the Grant researchers selected a total of 268 students from the sophomore classes during the academic years of 1938–1939, 1939–1940, 1940–1941, and 1941–1942. Because they wanted to select "as wide a group of 'normal,' healthy, and superior young men as was possible," the researchers "preferred to select participants from the point of view of 'successful living' than from the arbitrary, rigid standards" such as athletic ability, popularity, geography, or socioeconomic status. To get a potential pool of successful sophomores, the researchers asked the deans for a list of sophomores "who, regardless of social or financial position, nature of preparatory school or academic rating, seemed to be meeting their college obligations in a 'normal' fashion," that is, they were not failing any of their classes. From that list, researchers screened out students with any "frank disability" such as diabetes, polio, heart disease, or "maladjustment" to their home or school environment. Researchers also eliminated men who had "a poor chance of carrying their college work to completion" and/or had a verbal SAT score of less than 500. All of these selection criteria managed to eliminate about 75% of each sophomore class, which led to some concerns about the quality of young men being admitted to Harvard. In addition, despite efforts to ensure a broad range of geographic, socioeconomic, and ethnic backgrounds, 61% of the grantees came from New England or New York State, 64% came from families that made more than $5,000 per year, nearly 50% of the participants were educated exclusively at private schools, the majority were affiliated with Protestant denominations, all of them were white, and all but eight were born in the United States.[45] This roughly approximated the undergraduate population at Harvard

44. Earnest Hooton, *"Young Man, You Are Normal": Findings from a Study of Students* (New York: G. P. Putnam's Sons, 1945), p. 8.

45. Selection criteria and information on the backgrounds of the participants are described in Clark Wright Heath, *What People Are: A Study of Normal Young Men* (Cambridge, MA: Harvard University Press, 1945), pp. 110–14, pp. 110–11; John P. Monks, *College Men at War* (Boston: American Academy of Arts and Sciences, 1957), pp. 4–5.

during this period. At the same time, researchers were quick to point out that the Grant subjects were taller, heavier, more muscular, had better posture, and came from better families than the "average" Harvard man. Needless to say, most participants considered it an honor to be selected for the study, and the Grant staff frequently had to deal with disgruntled parents who were upset that their sons had not been included in the pool of normal young men.[46]

Once they were selected for the study, each student spent about twenty hours undergoing various physical exams, laboratory tests, physical fitness evaluations, psychological interviews, and anthropometric measurements. A social worker also interviewed each young man and his family regarding their socioeconomic status and family background.[47]

A major focus of the study was the relationship between somatotype or body composition and personality, an interest that was strongly shaped by the ideas of William Sheldon, who was a member of the Harvard psychology department during the early years of the study. Sheldon is best known for his theory of constitutional psychology, which was based on the notion that intelligence, personality, and body type were codependent, since all three were determined by the individual's genetic endowment. Sheldon claimed that there were three basic body types that existed in all individuals to varying degrees: endomorphy (round, flabby type); mesomorphy (firm, muscular body type); and ectomorphy (thin, fragile body type). These three body types corresponded to three basic personality types: endomorphy was linked with relaxed sociability (viscerotonia); mesomorphy with aggressive vigor (somatotonia); and ectomorphy with internalized hypersensitivity (cerebrotonia). Both viscerotonia and somatotonia were considered extroverted personality types, while cerebrotonics were considered introverted. Sheldon's system was also used to assess masculine and feminine characteristics in various individuals. Since wide hips and fatty deposits on the chest were considered feminine characteristics, men who exhibited these traits were considered to have a "weak masculine" or even "feminine" body type. Conversely, women who had narrow hips and excessive amounts of muscle tone were considered masculine in their body type. Individuals who did

46. Hooton, (n. 44) *"Young Man"*, p. 111; Monks, (n. 45) *College Men*, pp. 4–5; Arlie Bock to Adele Morrison, 24 February 1939, Grant Foundation Papers, Box 80.

47. Heath, (n. 45) *What People Are*, pp. 12–13.

not exhibit a predominance of either masculine or feminine body characteristics were labeled "androgynous." These personality and body types also appeared to be linked to intellectual ability and, by extension, could be used to place individuals into certain occupations. Sheldon argued that men who were primarily mesomorphic were best suited to "manly" occupations such as business and law, which required extroverted interpersonal skills and leadership abilities. In contrast, those who were ectomorphic were more suited to professions such as literature or art that would make the best of their introverted tendencies.[48]

Sheldon also studied the relationship between body type and mental illness. This connection was first suggested by the German psychologist Ernst Kretschmer, who found that extreme ectomorphs had a greater tendency toward schizophrenia, while excessive mesomorphs were more likely than others to have manic-depressive psychoses.[49] In his book *Varieties of Delinquent Youth,* Sheldon compared the personalities and body types of 200 juvenile offenders at the Hayden Goodwill Inn in Boston with those of controls selected from the student body at Phillips Academy in Andover, Massachusetts. Sheldon suggested that delinquents had a greater tendency toward excessive mesomorphy than their normal counterparts.[50]

At Harvard, once researchers accumulated the data from the anthropometric and psychological tests, they began to calculate the correlation between body type and personality characteristics. In general, researchers found that men with highly masculine physiques tended to be "well integrated", "vital" in affect, emotionally stable, friendly in their social relations, interested in "practical" fields like physical science and engineering, "with strongly pragmatic, humanistic, and political attitudes." Men with weakly masculine physiques, in contrast,

48. William Sheldon, *Varieties of Human Physique: An Introduction to Constitutional Psychology* (New York: Harper and Brothers, 1940); Sheldon, *Varieties of Human Temperament: A Psychology of Constitutional Differences* (New York: Harper and Brothers, 1942).

49. Ernst Kretschmer, *Physique and Character* (New York: Harcourt Brace & Co., 1925).

50. William Sheldon, *Varieties of Delinquent Youth: An Introduction to Constitutional Psychiatry* (New York: Harper and Brothers, 1949). For more information on Sheldon's impact on medicine at this time, see Sarah W. Tracy, "George Draper and American constitutional medicine, 1916–1946: Reinventing the sick man," *Bull. Hist. Med.*, 1992, *66*, 53–89; Tracy, "An evolving science of man: The transformation and demise of American constitutional medicine, 1920–1950," in Christopher Lawrence and George Weisz, eds., *Greater than the Parts: Holism in Biomedicine, 1920–1950* (New York: Oxford University Press, 1998), pp. 161–88.

tended to be "less well integrated" in personality, to be "sensitive" in affect, emotionally unstable, shy, and asocial, interested in "creative" and "ideational" fields like art, literature, and music, and were more often "self-conscious and inhibited and perhaps more likely to drive themselves by an exercise of will power against their natural tendencies."[51] In short, "highly masculine" men were more like what American society at the time expected men to be, and "weakly masculine" men fit popular stereotypes about women and their abilities.

One would think that flabby and "feminine" appearing men could become more masculine through body building or dieting, yet Grant researchers were fairly pessimistic about whether a particular individual's somatotype, and hence personality, could be altered through environmental changes. Grant researchers were careful to distinguish between men who were masculine but out of shape and men who were inherently "feminine" in their body type. They were also adamant that once a young man was characterized as weakly masculine, no amount of physical training could make him highly masculine; it could only make him healthier and slightly more physically fit.[52]

Rather than engaging in futile attempts to change a young man's natural endowments, Grant researchers suggested that colleges and universities should focus on guiding young men into careers suited to their individual characteristics. Highly masculine men, for example, should go into "manly" professions such as business, law, and medicine. In contrast, "less masculine" men should pursue careers in feminine fields such as the arts and humanities. Grant researchers underscored this association between masculinity and traditionally male careers through a study of fifty-two of the most successful salesmen and managers from Grant's department store chain. The researchers found that the managers "showed an essentially characteristic 'male physique' . . . similar to the physical type found in undergraduates intending to go into business."[53]

This linkage between "masculine" characteristics and career choice intensified during the Second World War, as members of the Grant study staff become involved in the examination of young men who

51. Hooton, (n. 44) *"Young Man,"* pp. 95–96.

52. Arlie Bock, "A short method for selecting combat officers," typescript, 1942, pp. 3–5, Grant Foundation Papers, Box 80.

53. William L. Woods, "Preliminary study of Grant Co. managers," typescript, September 1943, Grant Foundation Papers, Box 87.

were joining the armed services. Like other medical researchers of the period, the Grant staff was aware of the high rate of rejection and discharge for psychiatric reasons and wanted to find a reliable means of determining who would succeed in particular areas of the service. Once again, notions about the relationship between masculinity and success entered the picture. Researchers found that men with the strongest masculine component were the most successful in combat duty, while those with medium or weak masculinity were more suited to noncombat positions. Strongly masculine men were also more successful as officers, while those with low masculinity tended to be in enlisted positions, regardless of socioeconomic status before joining the military.[54]

Despite obvious similarities between the Grant study and research on homosexuality during this time, the Grant study staff was rather vague on the exact relationship between a "weak masculine component" and homosexuality.[55] In their guide for selecting officer candidates, for example, Bock and his colleagues noted that while low masculinity consisted of "mincing expressive movements, soft voice, delicacy, grace, or mannerisms usually thought of under this category," a man who possessed such characteristics was not necessarily a homosexual.[56] Conversely, another report indicated that homosexuals did not always possess a "pathological" deviation toward femininity, and could even have a thoroughly normal masculine physique. Nevertheless, large deviations from the highly masculine ideal were definitely "abnormal," and Grant researchers were quick to note that 90 percent of their Harvard sample fell into the "strongly masculine" category.[57] Thus, they clearly associated a highly masculine body type with "normality."

Developments in Nazi Germany eventually led the Grant researchers to tone down some of the racist and elitist aspects of their work. It is unclear whether this was due to a genuine change of heart or

54. Monks, (n. 45) *College Men*, pp. 181–83. For more on psychiatry during World War II, see Gerald Grob, *The Mad Among Us: A History of the Care of America's Mentally Ill* (New York: The Free Press, 1994), pp. 191–221.

55. See Jennifer Terry, "Lesbians under the medical gaze: Scientists search for remarkable differences," *J. Sex Res.*, 1990, *27*, 317–39; Allan Bérubé, *Coming Out Under Fire: The History of Gay Men and Women in World War Two* (New York: The Free Press, 1990).

56. William L. Woods, Arlie Bock, et. al. "Short interview method of selection of Army officers," 14 April 1942, Earnest A. Hooton Papers, Peabody Museum, Harvard University, Cambridge, MA, hereafter referred to as Hooton papers.

57. Monks, (n. 45) *College Men*, p. 181; Hooton, (n. 44) *"Young Man,"* pp. 82–83.

to the fact that racist ideas in science were becoming increasingly unpopular at this time.[58] Nevertheless, even Hooton—undoubtedly the most bigoted member of the research team—admitted in his popular writings that normalcy and deviance knew no racial, ethnic, or class boundaries, and he believed that "every tree that bears bad fruit" regardless of background, "should be cut down and cast into the fire." On the issue of Nazi racial policies, Hooton claimed that the Nazis were misguided in their persecution of Jews because centuries of persecution had made Jews superior to other races by "weeding out" the weaker individuals. Hooton even suggested that the rise of fascism in Europe was due to a failure to weed out "morons" and other deviants, thereby allowing "men like Hitler and Mussolini [to] impose their evil wills upon stupid and suggestible masses."[59]

During the 1940s, wartime pressures caused Grant researchers to expand their study of normalcy beyond the original sample of Harvard men. Because of wartime interest in selecting men for combat, Hooton contracted with the Quartermaster General's office to do a study of 100,000 army separatees, which included more than 3,000 black males and 9,000 members of the Women's Army Corps. At the same time, researchers also began studies on army chaplains, dental students, and boy scouts from a variety of socioeconomic backgrounds. After the war was over, in 1947, Grant researchers began a comparative study of sixty-five young women and men selected from the student councils of Bryn Mawr, Haverford, and Swarthmore colleges, again to determine the features of normal personality and development.[60]

In general, the findings of these supplementary studies were consistent with the ambivalent attitudes of the researchers toward race and gender: although they found that blacks were somewhat "inferior" in body build to whites, they also noted that "lack of social mobility

58. See Elazar Barkan, *The Retreat of Scientific Racism: Changing Concepts of Race in Britain and the United States Between the Wars* (New York: Cambridge University Press, 1992); William B. Provine, "Geneticists and race," *Am. Zool.*, 1986, *26*, 857–87; Franz Samuelson, "From 'race psychology' to 'studies in prejudice': Some observations on the thematic reversal in social psychology," *J. Hist. Behav. Sci.*, 1978, *14*, 265–78; Richard Weiss, "Ethnicity and reform: Minorities and ambiance of the Depression years," *J. Am. Hist.*, 1979, *66*, 566–85.

59. Ernest Hooton, "Plain statement about race," *J. Am. Assoc. University Women*, June 1936, p. 4; Hooton, "Morons into what?" *Woman's Home Companion* 1943, *70*, 4. See also Hooton, "Why the Jew grows stronger," *Colliers* 6 May 1939, pp. 12–13, 71–72.

60. Milofsky, (n. 43) pp. 15–16; Earl D. Bond and Rachel Dunaway Cox, "A proposal to the Grant Foundation for a study of the normal personality, May 1, 1958," Grant Foundation Papers, Box 9, Applications Folder.

and restricted economic opportunity" was a major cause of these deficiencies. Researchers were less generous toward female subjects, however, and observed that because of their physical and psychological limitations, women were unsuited for military combat and other "manly" pursuits.[61]

The additional studies outlined above were only brief digressions, however, and the original sample of Harvard undergraduates remained the primary focus of the Grant Study for the next fifty years. After World War II, the Harvard researchers continued to use only the original Harvard sample for follow-up studies, the last of which was completed in 1990. Despite changing attitudes about race, class, and gender over the past half-century, the Grant researchers never completely abandoned the idea that one could use Harvard undergraduates to assess the qualities of normal masculinity and professional success. The head of the follow-up study, George E. Vaillant, acknowledged that the total absence of women and blacks was "an unforgivable omission that will require another study to correct." Yet in his last report in 1990, Vaillant noted that by avoiding complicating factors like sex, economic status, and race, he and his colleagues were able "to focus on more subtle forces that propel one person forward while another lags."[62]

Moreover, Vaillant and his associates continued to use white, upper-middle class standards of professional success and "masculine" personality characteristics as the criteria for normalcy. In his book *Adaptation to Life*, published in 1977, Vaillant used the case of "Allan Poe" to illustrate all the characteristics of unsuccessful male maturation. Vaillant described Poe as a homosexual, thrice divorced, impoverished, alcoholic poet, who had been a conscientious objector during the Second World War, and resided in humble quarters in San Francisco's North Beach area, an unlikely residence for someone "whose Social Register parents had sent him to Lake Forest private schools, Andover, and finally an establishment college." In short, Poe flunked every test on Vaillant's maturity scale, a fact that had been predicted by the original Grant researchers, who described Poe as an unstable and

61. *Body Build in Relation to Military Function in a Sample of the United States Army.* Research and Development (contract W44-109-qm-1078) Office of the Quartermaster General, Department of Anthropology, Harvard University in Hooton papers.

62. George E. Vaillant, "The 'normal boy' in later life: How adaptation fosters growth," *Harvard Magazine*, Nov.–Dec. 1977, p. 46; see also Daniel Coleman, "Men at 65: New findings on well-being," *New York Times*, 16 January 1990, pp. C1, 12.

eccentric youth whose personality and physique resembled that of Noel Coward. Vaillant, of course, conveniently dismissed Poe's wry observation that perhaps the Grant researchers were wrong, and it was really the "poor bastard who's fulfilled all your criteria for successful adaptation for life" and retired to "some aged enclave near Tampa just staring out over the ocean waiting for the next attack of chest pain" who was the one who was "abnormal."[63]

The Grant study was one example of a number of similar studies that used the student body to represent normal psychological development. For example, Sheldon continued to compile data on student body types from the posture pictures from elite male colleges described earlier, as well as from new studies conducted at state land grant universities and teachers colleges during the 1940s and 1950s. Sheldon published the results of his studies of male body types in numerous books and articles, including the monumental *Atlas of Men* (1954), which was aimed at assisting psychologists and psychiatrists in diagnosing personality problems, as well as college admissions officers who wanted to fit each student to a particular field of study and career based on body type.[64]

Sheldon hoped to follow up with an "Atlas of Women," culled from posture pictures at women's colleges and departments of physical education at state universities, but the project quickly ran into trouble. Sheldon claimed that such a study, like *Atlas of Men*, would be of great value to those involved in college admissions, college hygiene, and vocational counseling, because these data could be used to predict future health problems and aptitude for certain careers. A few college officials agreed, but many more were disturbed about the ethics of releasing nude pictures of female students, even if their identities were concealed. Gertrude M. Baker of the University of Minnesota stated that "Our total program for college girls rests upon a psychology of free choice within the limits of the health rating. We would therefore violate this basis of operation if we required girls to have the examination here."[65]

63. George E. Vaillant, *Adaptation to Life* (Boston: Little, Brown and Co., 1977), pp. 351–59, pp. 352, 353, 358–59.

64. William Sheldon, *Atlas of Men: A Guide for Somatotyping the Adult Male at All Ages* (New York: Gramercy Publishing Co., 1954).

65. Gertrude M. Baker to Barbara Honeyman, 11 October 1949, William Herbert Sheldon Papers, National Anthropological Archives, National Museum of Natural History, Washington, DC (hereafter refereed to as Sheldon Papers), Box 10.

At the University of Washington, Sheldon's work on female students precipitated furious objections from parents, students, and alumni. University President Raymond B. Allen, originally an eager collaborator in the study, was eventually forced to halt the study and to impound and destroy all photographs and negatives "when it was discovered that the girls had not all been advised as to the nature of the research project and given the opportunity to withdraw if they wished."[66]

Physicians from the health service at Radcliffe College objected to Sheldon's study on scientific grounds. Radcliffe physicians worked closely with researchers from the Grant study and the Harvard Fatigue Laboratory to establish what they called a "base line of knowledge" about the "normal" college woman. Although the Radcliffe studies shared some of the Harvard researchers' assumptions about what constituted normality, Radcliffe researchers Harriet Hardy and Adelaide Bullen also challenged many of the Grant study's findings on body types in men. Hardy and Bullen observed that "any system of body classification based on sex differences should arise from factual morphological data on both sexes," which they claimed the Grant researchers had failed to do. Hardy and Bullen argued that body characteristics that Grant researchers had classified as "weakly masculine" or "feminine"—fat hips and thighs, protruding abdomens, lack of muscle, "feminine" arrangement of pubic hair—were not universal in all women and therefore could not be considered signs of femininity in men. Hardy and Bullen also drew on the work of Margaret Mead, suggesting that "certain aspects of masculinity and femininity may be differently defined in different cultures." In fact, Hardy and Bullen noted that the most frequently used "feminine" characteristic, curvy hips and buttocks, were "a cultural illusion perpetuated by clever girdle manufacturers" and should therefore not be used to classify men as weakly masculine.[67] Objections to Sheldon's studies on female body types emerged at other institutions, and Sheldon had no choice but to abandon the project in the mid 1950s.

The scandal surrounding Sheldon's work was rare, however, and most studies involving student subjects went quietly unnoticed in the

66. Raymond B. Allen to Mrs. Bertha Mayer 16 September 1950, Sheldon Papers, Box 10.

67. Adelaide Bullen and Harriet L. Hardy, "Analysis of body build photographs of 175 college women," *Am. J Phys. Anthropol.*, 1946, 4, 37–68, pp. 38, 59.

decades following the Second World War. In addition, the expansion of federal funding for medical research during the 1940s and 1950s created new opportunities for scientists to use the student body. Lederer shows how America's entry into World War II made medical experimentation "a patriotic responsibility for all Americans. Men, women, and children were pressed into service as research subjects as researchers joined the war effort." Federal funding for medical research grew dramatically in the postwar years in response to the needs of the Cold War: "In 1946 the National Institutes of Health received approximately $700,000 from the federal government. By 1955 the NIH appropriation exceeded $36 million; in 1970, NIH received nearly $1.5 billion from the federal government and administered over 11,000 grants." This growth in federal support for science led to increases in both the number of medical researchers and the number of experiments involving human subjects.[68]

Awareness of the atrocities committed by Nazi scientists also prompted some medical researchers to examine the ethics of human experimentation. Yet, as both Lederer and David Rothman demonstrate, most of the guidelines developed in the wake of the Nuremberg trials had little impact on American research practices. The American Medical Association did adopt a research code, but "the stipulations were vague and lacked any reference to means of enforcement. The code required the voluntary consent of the human subject but said nothing about what information researchers should impart; who, if anyone, should monitor the process; or what the ethics were of conducting research on incompetent subjects, such as the institutionalized mentally disabled."[69] There were some concerns raised about using prisoners in medical experiments, but only because of the belief that "parole boards were treating prisoner-volunteers too generously" by giving them early release in exchange for assuming medical risks, not because of the ethics of using prisoners in the first place.[70]

Little was said about the ethics of using college students in medical experiments, and thus medical researchers continued to take it for granted that the student body was an appropriate pool from which to draw research subjects. Researchers would occasionally question whether students were representative of the population as a whole, yet

68. Lederer, (n. 2) *Subjected to Science*, p. 140.
69. Ibid., p. 140.
70. David J. Rothman, *Strangers at the Bedside* (New York: Basic Books, 1991), pp. 68–69.

most continued to assume that students were ideal research material precisely because they came from the most advantaged social classes and could therefore understand the purpose and social value of medical experimentation. Researchers also continued to assume that students, particularly white males from the upper-middle classes, best represented the normal human population.

Some studies were directly related to improving the health of students and alumni. As in the past, treatment of diseases common to college students, most notably mononucleosis, formed a significant portion of college physicians' research.[71] Expansion of federal funding for medical research also allowed researchers to begin using the data collected from student health examinations. One of the largest projects in this area was the College Alumni Health Study, which examined the factors contributing to chronic disease in former college students. Begun in 1961, the study originally included 45,000 male graduates of either Harvard University or the University of Pennsylvania but by the mid-1960s also included several thousand female alumnae from the University of Pennsylvania. Data from this study were used to demonstrate the precursors of suicide, fatal coronary heart disease, fatal stroke, and cancer and to advise college health centers on how to cultivate good health habits in their students. The principal investigators in the study explained that they chose college alumni as subjects because of the large amount of previously unused data collected by "capable examiners" on "intelligent and interested subjects," who continued to demonstrate "a fine willingness to cooperate with follow-up investigations." Researchers admitted that some might question whether college students were representative of the general population "insofar as university selective processes have been effective," but claimed that students included "a wide diversity of physical types, psychological traits, and social, religious, geographic, and ethnic backgrounds." More important, the "common denominator of promising intellectual ability and potential for accomplishment places them among those individuals whose early coronary death must be of greatest loss to society."[72]

71. Mary G. M. Boyer, "Therapeutic trial of gamma globulin in infectious mononucleosis," *Student Medicine*, 1960, *8*, 264–67; Curtis Prout and Willard Dalrymple, "A double-blind study of eighty-two cases of infectious mononucleosis treated with corticosteroids," *J. Am. Coll. Health Assoc.*, 1966, *15*, 62–66.

72. Ralph S. Paffenbarger, Jr., Philip A. Wolf, Joel Notkin, and Melvyn C. Thorne, "Chronic disease in former college students I: Early precursors of fatal coronary heart

College students were also involved in what later became some of the most controversial research projects involving human subjects during the Cold War era. Among these were the various human radiation experiments sponsored by the Atomic Energy Commission, the Department of Defense, and other federal agencies during the 1940s through the 1960s. Like the human radiation experiments in general, evidence describing the use of students is fragmentary because the records of these studies were classified in the interest of national security, and many were destroyed in reaction to widespread scandals involving human subjects in the 1970s and 1980s.[73] Based on what has survived, it is clear that students (medical students in particular) were regularly used as healthy volunteers in a number of federally funded human radiation experiments. Some projects were noninvasive, such as the study of muscle atrophy that was conducted by the radiologist Marvin Goldman at the University of California, Davis in the 1960s. Funded by the National Aeronautics and Space Administration, the study examined the phenomenon of muscle disuse atrophy by measuring the amount of naturally occurring radioactive potassium in the body. (One out of every 2,000 potassium atoms on the planet is radioactive, and the amount of potassium in the body decreases in proportion to the amount of muscle mass.) Goldman collaborated with Ed Bernauer, professor of physical education at Davis, who recruited students from the athletic department to participate in a study that examined the effects of three weeks of bed rest on muscle mass. However, Goldman did find that student athletes did not always make ideal subjects. Those who were naturally athletic found it difficult to remain motionless for the length of time required by the study, a tendency that was exacerbated during periods when the participants' girlfriends were allowed to visit.[74]

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disease," *Am. J. Epidemiol.*, 1966, *83*, 314–27, pp. 314–15; Ralph S. Paffenbarger, Jr., Joel Notkin, et. al., "Chronic disease in former college students II: Methods of study and observations on mortality from coronary heart disease," *Am. J. Public Health*, 1966, *56*, 962–71; Ralph S. Paffenbarger, "Chronic disease in former college students VI: Implications for college health programs," *J. Am. Coll. Health Assoc.*, 1967, *16*, 51–55; Melvin C. Thorne, Alvin L. Wing, and Ralph S. Paffenbarger, Jr., "Chronic disease in former college students VII: Early precursors of nonfatal coronary heart disease," *Am. J. Epidemiol.*, 1968, *87*, 520–29.

73. The difficulty in locating sources is described in *The Human Radiation Experiments: Final Report of the President's Advisory Committee* (New York: Oxford University Press, 1995), pp. xxv–xxvi.

74. Marvin Goldman Oral History, Department of Energy Human Radiation Experiments website, http://tis.eh.doe.gov/ohre/roadmap/histories/0468/0468toc.html. Accessed July 2001.

Other projects involved introduction of radioactive substances into the human body and thus carried greater risks. One example is the study of human ingestion of real and simulated fallout conducted at the Argonne Cancer Research Hospital in Chicago during the 1960s. The purpose of the study was to gain information about the effects of fallout ingestion that could be used for military and civil defense planning. A total of 102 healthy volunteer university students and hospital staff participated in the study, which involved ingestion of radioactive fallout from the Nevada test site, and measurement of radioactivity remaining in the subjects at various intervals after ingestion.[75] Similarly, physiologist Nello Pace of the University of California at Berkeley regularly recruited students to participate in his research on radioactive isotopes. In a recent oral history, Pace recalled that student volunteers were concerned about exposure to radiation, but he eased their fears by telling them that the dosage was low, and that researchers had tested the substance on themselves before recruiting volunteers. Pace recalled that his student volunteers recognized the national importance of this work, and were eager to volunteer for his studies.[76]

Even studies that did not use radioactive material could involve risk of permanent injury, or at least considerable temporary pain and discomfort. For example, Everett Idris Evans at the Medical College of Virginia (MCV) studied the effect of thermal burns for the Department of Defense and was particularly interested in determining the degree to which skin pigmentation determined the degree and severity of flash burns. Evans recruited white and African-American student volunteers from the MCV and the Virginia Union University, respectively, including several women and a variety of skin types within the white student sample. Volunteers were paid a small stipend to have dime-sized, second-degree burns inflicted on their backs and arms, injuries which Evans considered to be "the minimal burn injury to be expected from an atomic bomb." Evans found that those with darker skin pigmentation absorbed more incident radiation, leading to more severe burns. Evans also reported that subjects experienced

75. G. V. Leroy, J. H. Rust, and R. J. Hasterlik, "The consequences of ingestion by man of real and simulated fallout," *Health Phys.*, 1966, 12, 449–73.

76. Nello Pace Oral History, DOE Human Radiation Experiments website, http://tis.eh.doe.gov/ohre/roadmap/histories/0476/0476toc.html. Accessed July 2001.

a "stinging-burning pain" that lasted anywhere from fifteen to thirty minutes.[77]

Another notorious area of research involving student subjects were the studies of hallucinogenic drugs conducted in the 1950s and 1960s. The studies that raised the most controversy at the time were the LSD studies performed by Timothy Leary and Richard Alpert, professors of clinical psychology affiliated with Harvard's Center for Research in Personality. Leary and Alpert started the study in 1960 and were originally interested in the therapeutic potential of LSD and related drugs. Yet soon most of their efforts were directed in studies of the drug's mind-expanding effects on normal subjects. As Leary and Alpert's increasingly flagrant recruitment of subjects from the student body became local and then national news, their study was denounced by Health Services Director Dana Farnsworth, Dean John U. Monro, and other members of the Harvard administration. Eventually, Harvard University officials persuaded Leary and Alpert to promise not to use undergraduates as research subjects, but Leary's memoirs suggest that he and Alpert largely ignored this agreement.[78]

Yet similar experiments involving hallucinogenic drugs and other controlled substances had been going on elsewhere at Harvard, as well as at other universities around the country, with little notice or objection. This was partly due to the fact that many of these studies were sponsored by the Department of Defense and the Central Intelligence Agency, and therefore were classified until the 1970s. The DOD/CIA experiments were extensions of work conducted during the Second World War by the Office of Strategic Services, which sought to find a "truth drug" or some other thought control technique that could be used to force enemy agents and prisoners of war to disclose military secrets. Interest in this research escalated during the Korean War, in response to allegations that the Soviet Union, China, and North Korea had used mind-altering drugs and brainwashing techniques on American prisoners of war. Evidence about the specific

77. Everett Iris Evans, et. al., "Flash burn studies on human volunteers," *Surgery*, 1955, *37*, 280–97. I extend thanks to Susan Lederer for sending me information on this study.

78. J. Kenneth Benson and James Otis Smith, "The Harvard drug controversy: A case study of subject manipulation and social structure," in Gideon Sjoberg, ed., *Ethics, Politics, and Social Research* (Cambridge, Mass.: Schenkman Publishing Company, Inc., 1967), pp. 115–40; Timothy Leary, *Flashbacks: A Personal and Cultural History of an Era: An Autobiography* (New York: G. P. Putnam's Sons, 1990).

nature of these studies is scarce because most of the records were deliberately destroyed in 1973 at the request of the CIA director at the time, Richard Helms.[79]

Publications and personal testimony that has survived indicate that undergraduate and medical students were commonly used in such studies. One of the earliest studies of this nature was the work of G. Richard Wendt, chairman of the psychology department at the University of Rochester, who worked for a highly classified project called CHATTER for the navy beginning in 1950. That year, the navy gave Wendt a $300,000 contract to find a truth-inducing substance. Wendt studied the effects of a variety of drugs, including barbiturates, amphetamines, alcohol, and heroin. Like psychological researchers in the past, Wendt tested the substances on himself first, and then recruited student subjects through announcements on campus bulletin boards. Perhaps in recognition of the potential risks of his study, or at least liability issues involving tests on minors, Wendt only chose male subjects over the age of 21, and paid all subjects $1 per hour for participation in the study. Other notable studies include the various projects sponsored by the CIA under the code name MKULTRA conducted by Amedeo Marrazzi of the University of Minnesota and Missouri Institute of Psychiatry, Henry Beecher and Max Rinkel of Harvard and Massachusetts General Hospital, James Dille of the University of Washington, Gerald Klee of the University of Maryland Medical School, Neil Burch of Baylor University, and Paul Hoch and James Cattell of the New York State Psychiatric Institute, all of which recruited volunteers from the student body.[80]

The Harvard studies are especially intriguing due to the controversy surrounding the work of Leary and Alpert, as well as the fact that Henry Beecher would later become a prominent advocate for reforming the treatment of human subjects in medical research. Personal recollections from student subjects and researchers involved in the Harvard study indicate that students were not fully informed about the nature of the study, nor were they warned of the potential risks of taking hallucinogenic drugs.[81] Beecher's research assistant, Louis Lasagna, recalled that "It wasn't that we were Nazis and said, 'If we

79. *The Human Radiation Experiments*, (n. 73), pp. 106–7.
80. John Marks, *The Search for the Manchurian Candidate* (New York: Dell, 1979); available at www.druglibrary.org/schaffer/lsd/marks.htm; accessed July 2001.
81. Ibid., chpt. 8.

ask for consent we lose our subjects,' it was just that we were so ethically insensitive that it never occurred to us that you ought to level with people that they were in an experiment."[82] As early as 1954, Lasagna began to raise questions about the presumed normality of their student subjects. Lasagna found that students who volunteered for medical experiments were motivated not by the intelligent scientific interest imagined by Diehl and other college physicians, but by financial need and/or the desire for new experiences, thrills, or kicks. These characteristics were especially common in the tests of hallucinogenic drugs, but Lasagna also found the same "volunteer factor" in other research projects. Lasagna concluded that not only were student volunteers not normal in comparison to the general population, it was uncertain whether they were even representative of the special subgroup of college students. However, even the discovery of the volunteer factor did not immediately call into question the ethics of the more general practice of using students as research subjects: instead, Lasagna and others simply suggested that studies of volunteers should be balanced with those of randomly selected nonvolunteers culled from undergraduate and graduate classes, prisons, the military, and other captive groups.[83]

It was not until the disclosure in the mid-1960s and 1970s of widespread abuses in clinical research that the use of students as research material was more thoroughly scrutinized. To be sure, research on students was not nearly as controversial as Tuskegee syphilis experiment or the hepatitis study at Willowbrook School for retarded children, yet critics did challenge the readiness with which researchers drew upon the student body for experimental material. Beecher, who became one of the leaders in the effort to expose outrageous research practices, pointed out that students were "captive groups, not as prisoners of war are, but nonetheless subject to certain kinds of subtle coercion" such as the promise of extra credit, better grades, or financial rewards for their participation in medical research.[84] Harvard

82. Louis Lasagna, interview with Jon M. Harkness and Suzanne White-Junod (ACHRE), transcript of audio recording, 13 December 1994, quoted in *The Human Radiation Experiments*, (n. 73), p. 79.

83. Louis Lasagna and John M. von Felsinger, "The volunteer subject in research," *Science* 1954, *120*, 359–61. See also Harold Escover, Sidney Malitz, and Bernard Wilkens, "Clinical profiles of paid normal subjects volunteering for hallucinogen drug studies," *Am. J. Psychiatry*, 1961, *117*, 910–15.

84. Henry K. Beecher, *Research and the Individual* (Boston: Little, Brown, 1970), p. 77. See also Louis Lasagna, "Special subjects in human experimentation," *Daedalus*, 1969, *98*,

University was the first to create guidelines for the use of students in medical research: Dana Farnsworth drafted a set of rules governing the use of undergraduate students in medical experiments, which was approved by the president and fellows in April 1963. A similar set of guidelines for use of medical students was written by medical school Dean Robert H. Ebert and approved by the Harvard trustees in 1965.[85]

Developments at Harvard and similar studies on the ethics of human experimentation led to major reforms in the treatment of human subjects. These efforts culminated in 1974, when Congress passed the National Research Act, which "mandated formal protections for human subjects, including written consent and institutional review boards, composed of both medical professional and lay persons, to evaluate proposals involving experiments on human beings."[86]

However, as Lederer argues, "the advent of federal regulation has not resolved the ethical issues raised by human experimentation."[87] Federal laws protecting human subjects do not provide explicit protections for students and other normal volunteers who are recruited for medical experiments. The case of Nicole Wan, and a similar case involving a student in a gene therapy experiment at the University of Pennsylvania, have led to increased scrutiny of research projects involving student subjects by the Office of Human Research Protections. Yet protection of student subjects remains scattershot at best, and there is strong evidence that many students recruited for medical research projects receive little information about the risks that participation in such studies poses to their health and safety.[88]

By raising these points, I do not wish to condemn all research involving students. Like all research on human subjects, projects that use students have come up with useful information, some of which has improved the health of students themselves. I do want to question

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449–62. For more on Beecher's work and its significance, see Rothman, (n. 69) *Strangers*, pp. 70–84.

85. Dana L. Farnsworth, "Harvard University Health Services Rules Governing the Participation of Healthy Human Beings as Subjects in Research," 1963; Robert H. Ebert, "Harvard Medical School Rules Governing the Participation of Medical Students as Experimental Subjects," 1965. Henry K. Beecher Papers, Countway Library of Medicine, Harvard Medical School, Boston, Massachusetts (hereafter referred to as Beecher Papers), Box 6, Folder 72.

86. Lederer, (n. 2) *Subjected to Science*, pp. 141–42.

87. Ibid., p. 142. See also Rothman, (n. 69) *Strangers*, pp. 85–100.

88. Rachel Louise Snyder, "Uninformed consent," www.salon.com, 27 March 2000.

assumptions that have shaped the choice of students as research subjects. Here I have demonstrated that students have historically been considered ideal research material partly because of their availability. In this sense, the experience of college students is similar to that of captive populations in orphanages, prisons, asylums, and schools. Lederer's work on "orphans as guinea pigs" and Harry Hendrick's work on school medical services demonstrate that agencies that aimed to help the less fortunate also found inmates of these institutions to be convenient research subjects.[89] College students differ from captive groups in that they typically share the same social and cultural background as the researchers conducting the experiment and possess considerable financial and social clout. Researchers have complained about the problems of controlling the variables of experiments involving students but have been loathe to restrict the autonomy of college students because doing so would undermine students' willingness to subject their bodies to science and provide financial support to their alma maters after graduation. Therefore, unlike inmates of prisons and asylums, students usually have the freedom to control the experimental setting or leave it entirely if they so desire. Nevertheless, the potential for exploitation of student subjects is still present. Most controversial are requirements that students participate in research for course credit or extra credit, a practice that is still common in medical schools and psychology departments. Students who do not receive course credit can also be vulnerable to exploitation, particularly if there is a financial incentive involved, but also if the student perceives that refusal to participate can negatively affect a relationship with an investigator or the faculty more generally.[90]

89. Susan Lederer, "Orphans as guinea pigs: American children and medical experimenters, 1890–1930," 96–123, and Harry Hendrick, "Child labour, medical capital, and the school medical serivice, c. 1890–1918," 45–71, both in Roger Cooter, ed., *In the Name of the Child: Health and Welfare, 1880–1940* (London: Routledge, 1992).

90. For recent discussions of the use of students in medical research, see *Protecting Human Subjects: Institutional Review Board Guidelines* (Bethesda, Md: National Institutes of Health, 1993); Robert J. Levine, *Ethics and Regulation of Clinical Research*, 2nd ed. (Baltimore, Md.: Urban and Schwarzenberg, 1986), pp. 80–82; Dennis M. Maloney, *Protection of Human Research Subjects: A Practical Guide to Federal Laws and Regulations* (New York: Plenum Press, 1984); National Institutes of Health, *Protecting Human Subjects: IRB Guidelines* (Bethesda, Md.: National Institutes of Health, 1993); Nancy R. Angoff, "Against special protections for medical students," *IRB: A Review of Human Subjects Research*, 1985, *7*, 9–10; Brazzell, Romulus K. and Wayne A. Colburn, "Controversy I: Patients or healthy volunteers for pharmacokinetic studies?" *J. Clin. Pharmacol.*, 1986, *26*, 242–56; Nicholas Christakis, "Do medical student research subjects need special protection?" *IRB*, 1985, *7*, 1–4; Jeffrey M. Cohen, "Extra credit for research subjects," *IRB*, 1982, *4*, 10–11; H. F. Gamble, "Case study:

In this essay I have also shown that policies about using students have frequently been shaped by assumptions about who is most valuable to society. As Eileen Nechas and Denise Foley show in their book *Unequal Treatment*, "decisions on what aspect of health to study, on what research protocol to fund" are based "not only on scientific merit . . . but on a judgment of social worth. What is valuable to medicine is who is valuable to society, and that is white men."[91] In the case of students, assumptions about social value have been used to both justify and prohibit their participation in medical research. Students, especially white males, were frequently recruited as research subjects because they were considered to be ideal human specimens. Affirmative action in higher education has ensured that the student body is now more ethnically and socially diverse than it was at the beginning of the century, but college students are still not a representative cross-section of the general population. More important, despite attempts to make sure that research projects include both male and female subjects and those from racial minorities, there is still a tendency to present the white male body as the norm for all human beings.[92] Therefore, we should still be cautious about medical research that attempts to use the student body—especially the white, male student body—as the standard of normality for us all.

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students, grades, and informed consent," *IRB*, 1982, *4*, 7–10; Thomas A. Shannon, "Case study: Should medical students be research subjects?" *IRB*, 1979, *1*, 4.

91. Eileen Nechas and Denise Foley, *Unequal Treatment: What You Don't Know About How Women are Mistreated by the Medical Community* (New York: Simon and Schuster, 1994), pp. 14–15.

92. For more on this point, see Lisa Cartwright, "A cultural anatomy of the visible human project," 130–170, and Anne K. Eckman, "Beyond 'The Yentyl syndrome': Making women visible in post-1990 women's health discourse," both in Paula A. Treichler, Lisa Cartwright, and Constance Penley, eds., *The Visible Woman: Imaging Technologies, Gender, and Science* (New York: New York University Press, 1998).