

# Biography

**Richard Chatham Atkinson** (born 19 March 1929) is an American professor of psychology and cognitive science and an academic administrator. He is president emeritus of the University of California system, former chancellor of the University of California San Diego, and former director of the U.S. National Science Foundation.

## Early years

Atkinson was born in Oak Park, Illinois to Herbert and Margaret Atkinson. He earned his bachelor's degree at the University of Chicago and Ph.D. at Indiana University. After serving two years in the U.S. Army, Atkinson joined the faculty at Stanford University in 1956. Except for three years at UCLA, he served as professor at Stanford from 1956 to 1980.<sup>1</sup>

## Stanford years

At Stanford University he held appointments in the Department of Psychology, School of Engineering, Graduate School of Education and Institute for Mathematical Studies in the Social Sciences. In the mid-1960s, Atkinson began publishing a series of papers with his graduate students and post-doctoral fellows that formed the foundation for a general theory of human memory. Of that group of papers, the most influential is a 1968 article titled "Human Memory: A Proposed System and its Control Processes."<sup>2</sup> His co-author, Richard Shiffrin, was a young Stanford graduate student.

The theory postulates a distinction between a short-term memory of limited capacity and a large long-term memory; control processes allow the entire system to function. The control processes determine how different types of information are encoded in short-term memory, how they are transferred to long-term memory, and how the encoded information is retrieved from memory and the decision rules that govern retrieval. For many experimental situations, the theory can be formulated as a mathematical model. For more complex tasks, the theory usually can be implemented as a computer simulation.

The theory is generally referred to as the "modal model of memory" or the "Atkinson-Shiffrin Theory". Their 1968 article is one of the most highly cited in the behavioral and cognitive sciences, and the theory continues to shape research today.<sup>3</sup> In 2019, the journal *Memory and Cognition* devoted a special issue in recognition of five decades of research inspired by the theory.<sup>4</sup>

A quite different strand of Atkinson's research concerned computer-based instruction. An example is a program for teaching reading in grades K-3.<sup>5</sup> A "response history" is maintained on each student and continually updated. Built into the program is a model of the learning process that analyzes the student's response history to make moment-by-moment decisions as to what should be studied next to optimize the student's performance.<sup>6,7</sup> Atkinson and his colleague, Patrick Suppes, founded Computer Curriculum Corporation, the first company to introduce computers in the classroom.<sup>8</sup>

While at Stanford, Atkinson served as founding editor for the *Journal of Mathematical Psychology*. He was also chair of the *Mathematical Social Science Board* of the Center for Advanced Study in the Behavioral Sciences, which ran summer institutes (among other activities) for advanced doctoral students interested in learning about mathematical models in the behavioral and social sciences.

In 1967, Atkinson and his wife, Rita, joined their colleague, Ernest Hilgard, as authors of the textbook, *Introduction to Psychology*. They ceased being authors after the 12<sup>th</sup> edition and in later editions the title was changed to *Atkinson and Hilgard's Introduction to Psychology*.

## National Science Foundation

In 1975, Atkinson took a leave of absence from Stanford to accept a temporary appointment as deputy director of the National Science Foundation (NSF). It became an eventful five-year tenure, including service as acting director and then director under President Jimmy Carter.<sup>9</sup> Atkinson guided the

agency through what one commentator called “a rebuilding from the ravages of the Nixon anti-science era.” He proved to be particularly effective at defending peer review and basic research against Congressional and media attacks.<sup>10</sup>

Convinced that building a closer relationship between industry and research universities was crucial to the future of American science, Atkinson took a series of steps that have had far-reaching consequences: (1) Established the NSF Industry-University Cooperative Research Program at a time when collaborative research between private companies and universities, now widely accepted, was rare. (2) Initiated a special program at NSF to fund research on the relationship between investments in research and economic growth, an early contribution to the field of economics called “new growth theory.” (3) Elevated engineering to a full directorate at NSF. (4) Advocated with the Congress for legislation that gave companies a tax credit for investing in their own research and for supporting university research. (5) Initiated a series of policy studies that led to the 1980 Bayh-Dole Act, which transferred intellectual property rights in federally sponsored research from the U.S. government to universities. These efforts revamped the transfer of technological innovations from universities to industry, thereby enhancing American economic competitiveness.<sup>1</sup>

The first memorandum of understanding between the People’s Republic of China and the United States, an agreement for the exchange of scientists and scholars, was negotiated and signed by Atkinson while director.

## **UC San Diego**

As chancellor of the University of California, San Diego (UCSD) from 1980-1995, Atkinson instituted a major reorganization of the campus and began a sustained effort to strengthen UCSD’s ties with the city of San Diego. This effort yielded dividends in the form of financial and community support, with private giving rising dramatically during his chancellorship. Despite a series of tight budgets in the late 1980s, he found innovative ways to fund the construction of new buildings and to support new academic programs. UCSD’s increasing academic stature was reflected in its 1982 election to membership in the prestigious Association of American Universities, consisting of 62 of the nation’s top research universities. In 1995, the quality of its research and graduate programs was ranked tenth in the nation by the National Research Council. The only public universities in the top ten were UC Berkeley and UCSD.<sup>12</sup>

During his years at UCSD, Atkinson followed a strategy of encouraging technology transfer and active involvement with industry, especially with the small, high-technology companies that were springing up around San Diego. The UCSD CONNECT program began in 1985. It was successful in helping aspiring entrepreneurs find information and support on such topics as preparing a business plan, marketing, and attracting capital. UCSD’s outstanding faculty, innovative research, and commitment to industry-university partnerships were major factors in transforming the San Diego region into a world leader in technology-based industries.<sup>13,14</sup>

## **University of California System**

Atkinson became the University of California’s seventeenth president in October 1995. In that role, he faced some of the most contentious and complex challenges in American higher education, from the end of affirmative action at UC to the use and misuse of standardized testing in college admissions.<sup>15</sup> The issues that dominated the Atkinson administration were the issues shaping California: the state’s emergence as the world’s leading knowledge-based economy and the rapidly growing size and diversity of its population, which brought the largest student generation since the 1960s to the University’s door. Atkinson’s administrative and intellectual leadership of the University reflected a deliberate effort to define UC’s role in this changing California.<sup>1</sup>

### **Affirmative Action and UC outreach**

His earliest and greatest challenge was in the arena of UC admissions. He was named president in August 1995, just weeks after the UC Board of Regents voted to approve SP-1, which abolished the use of race and ethnicity as factors in admission and put UC in the national spotlight as the first major American university to end affirmative action in the admission of students. The ban on racial preferences was extended to all public entities in California sixteen months later with the passage of Proposition 209.

For UC's president, SP-1 and Proposition 209 were an exacting test of leadership in reversing three decades of race-attentive policies while also ensuring that UC, as a public university in the nation's most diverse state, continued to be seen as a welcoming place for minority students. Under Atkinson's leadership, the University dramatically expanded its partnerships with the K-12 schools to raise academic achievement throughout California, especially in those districts with high proportions of academically disadvantaged students. In 2001, the school/university partnerships served more than 97,000 students in 256 schools annually, representing a level of institutional involvement unprecedented in American higher education. At Governor Gray Davis's request and as part of his school reform initiative, the University established the Principal Leadership Institute, the California Professional Development Institutes, and a series of other initiatives to improve the preparation of California's teachers and K-12 administrators.

Eight years after the passage of SP-1, UC admitted more underrepresented students than in 1997, the year before SP-1 took effect. In Fall 1997, underrepresented minorities made up 18.8 percent of UC's systemwide freshman class; in Fall 2003, the figure was 19.8 percent.

With Atkinson's support, The Regents voted to rescind SP-1 in May 2001. The Board's resolution affirmed the University's intent to continue complying with Proposition 209's ban on racial preferences and reaffirmed UC's commitment to enrolling a student body that reflects both exceptional achievement and the broad diversity of California society.

### **Research for a dynamic economy**

Atkinson came to the UC presidency convinced that twenty-first century science requires new forms of organization and funding. In particular, his goal was to tap the enormous potential within the University for research that serves the needs of California's economy. One of his first acts as president was to establish the Industry-University Cooperative Research Program (IUCRP) to promote research partnerships with industry in disciplines critical to the state's economy. The IUCRP is now a multi-million dollar enterprise that supports annually more than 500 projects, jointly funded by State, UC, and industry funds, in areas ranging from biotechnology to digital media. The program is unusual in its emphasis on early-stage investigations that promise to yield new products and technologies and boost the state's economic productivity.<sup>15</sup>

To address a looming crisis in the state's supply of engineers and computer scientists, in 1997 Atkinson committed the University to increasing enrollments in those fields 50 percent by 2005-6. UC exceeded this goal in 2002, four years ahead of schedule, and engineering and computer science enrollments reached 27,000 in 2003-2004, up from 16,000 in 1997-98. The initiative represents the first real growth in the state's engineering programs since the 1968 Terman Report brought expansion of engineering education in California to a virtual halt.

Governor Davis, also a believer in the role of innovative research in ensuring California's economic leadership, was an enthusiastic supporter of the University's efforts. In 2000, he asked UC to establish four California Institutes for Science and Innovation (CISIs) on its campuses. The institutes bring together industry and university researchers to concentrate on scientific challenges that are ripe for application in the fields of nanotechnology, telecommunications and information technology, biotechnology and quantitative medicine, and information technology. The CISIs constitute far-reaching efforts to create new research and education programs and link them to the state's entrepreneurial industries through intensive partnerships.

### **Tidal Wave II and UC admissions policy**

Another challenge of the Atkinson era was preparing the University for a new generation of students—Tidal Wave II, the children of the Baby Boomers. Accommodating its share of Tidal Wave II meant finding a place on UC campuses for 63,000 additional (an enrollment increase of 40 percent) and recruiting 7,000 new faculty between 1998 and 2010. Atkinson initiated a comprehensive planning effort to help the University grow quickly without endangering its quality.

The Atkinson presidency was notable for its intense focus on the issue of educational opportunity, a matter of increasing public and legislative scrutiny because of SP-1 and growing competition for admission to UC. Atkinson played an active role in reshaping UC's admissions policies and practices to make them, in his words, "demonstrably inclusive and fair." On his recommendation, the University's Academic Senate and the Regents approved two new paths to admission: Eligibility in the Local Context and Dual Admission. Both programs cast a wider net for talent by supplementing traditional grades and test scores with broader measures of student achievement, among them what students have made of their opportunities to learn. In addition, undergraduate applicants now receive the kind of comprehensive review usually associated with selective private universities.

### **Achievement versus aptitude**

Atkinson has earned a place in the annals of standardized testing for his challenge to higher education's decades-long reliance on aptitude tests to predict students' readiness for college. He made national headlines in February 2001 when he told the American Council on Education that he had asked the Academic Senate of the University of California to drop the SAT examination requirement in favor of tests that assess what students actually learn in school rather than "ill-defined notions of aptitude." The announcement that the country's largest user of the SAT was considering eliminating it sent shock waves through American higher education, and Atkinson's case for achievement tests—that they are more reliable predictors of future success, fairer to students, and better guides for schools—unleashed a lively national debate on standardized testing.

In June 2002 the College Board, sponsor of the SAT, announced that beginning in 2005 it would make major changes in the test and would require a written essay. At the time Atkinson welcomed the proposed changes, but in actuality they proved to be far less than satisfactory. In a 2009 article he remained opposed to the use of the SAT in college admissions, and again argued for curriculum-based achievement tests.<sup>16</sup>

### **Post retirement**

After retiring from the University of California, Atkinson became chair of the Division of Behavioral and Social Sciences and Education and served in that position until 2011. The division works to advance the frontiers of the behavioral and social sciences and their applications to public policy; it is part of the National Academies of Science, Engineering and Medicine chartered by the U.S. Congress.

### **Personal life**

Atkinson married Rita Loyd, a Ph.D. psychologist, on August 20, 1952. They have one daughter, Lynn, a retired neurosurgeon. Lynn's husband is David Drucker, a pediatric surgeon, and their two children are Natalie and Adam Drucker.

### **Honors**

Atkinson's achievements have been recognized by election to the National Academy of Sciences, the National Academy of Medicine, the American Academy of Arts and Sciences, the National Academy of Education, and the American Philosophical Society. He is past president of the American Association for the Advancement of Science, former chair of the Association of American Universities, recipient of the Vannevar Bush Medal of the National Science Board, and a mountain in Antarctica has been named in his honor. Atkinson Hall, the home of the California Institute for Telecommunications and Information Technology at UC San Diego, is also named in his honor.

### **Further reading**

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## Notes

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