**AMERICAN PSYCHOLOGICAL ASSOCIATION**
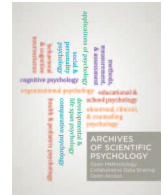
## Archives of Scientific Psychology

http://www.apa.org/pubs/journals/arc

# An Incomplete List of Eminent Psychologists of the Modern Era

Ed Diener
University of Virginia, University of Utah, and The Gallup Organization, Washington, DC

Shigehiro Oishi
University of Virginia

JungYeun Park
University of Illinois

A B S T R A C T

In the present paper, we analyzed citation impact, textbook citations, and major scientific awards to identify eminent psychologists of modern era (Post-World War II). Identifying these individuals serves educational, administrative, and scholarly purposes. Readers can more readily identify the psychologists who have made the most impact on the profession, as well as the type of contributions that receive recognition. In addition, young researchers can learn what is required if they want to achieve eminence. Finally, our analysis helps pinpoint imbalances in need of change, for example gender and ethnic disparities.

S C I E N T I F I C   A B S T R A C T

We systematically identified eminent psychologists, first using 6 sources to create an initial list of 348 eminent psychologists, and then using 3 criteria (citation metrics, textbook page coverage, and major awards) to select the most highly recognized psychologists. The rankings we produced corresponded highly with other indicators of eminence, and the top 200 are reported in the article. We also identified individuals who scored very high across all 3 indicators, as well as scientists who scored high when only 2 indicators were used. Individuals such as Daniel Kahneman and Albert Bandura ranked very high on the list of modern eminent psychologists. We found that the citation rate of the most eminent psychologists is growing at extremely high rates. A few high-prestige psychology departments heavily contributed to the doctoral education of a large number of the eminent psychologists. The most eminent researchers published an extremely large number of publications over many years; their renown rarely rested on 1 or 2 classics alone. High eminence was rarely achieved before age 50, and most of the eminent psychologists worked until late in their lives. Women are slowly gaining in eminence, but still lag substantially behind compared with their growing presence in scientific psychology. The numbers for ethnic minorities are disturbingly low and are a major concern for the field. Highly eminent psychologists come from many areas of psychology, not just from a few elite areas.

*Keywords:* eminence, creativity, productivity, citation
*Supplemental materials:* http://dx.doi.org/10.1037/arc0000006.supp
*Data Repository:* http://doi.org/10.3886/ICPSR35059.v1

In this article we identify through systematic analyses eminent psychologists in psychology since World War II. Identifying these individuals serves educational, administrative, and scholarly purposes. Students of psychology and their professors can more readily identify the psychologists who have had a high impact on the profession, as well as the type of contributions that receive recognition. The listing of eminent psychologists also gives students a way to study many of the most important discoveries in psychology.

The study serves administrative purposes by helping to identify psychologists who should receive recognitions in their universities, to locate eminent individuals to serve on relevant committees, and so forth. In terms of scholarship, the study helps identify what types of contributions have had the most impact and are most widely recognized in the field. Furthermore, it indicates several of the traits that are associated with high eminence, and the characteristics that must be fostered by a society to create high scientific productivity. Cattell (1910) suggested a century ago that understanding who is eminent in a science helps create a psychology of science, in that knowing who is eminent is a step in identifying what leads to scientific creativity and productivity (see Annin, Boring, & Watson, 1968; Endler, Rushton, & Roediger, 1978; Simonton, 2002 for more recent reviews). Finally, the rankings help pinpoint imbalances in need of change, for example sex and ethnic disparities.

Our list started with 348 eminent psychologists drawn from several sources, and 12 additional historically important figures that we included for comparison purposes. We intend the historical list to present a few eminent historical figures in psychology, but not to be a complete list of such persons. These eminent historical figures serve as a point of reference for the modern eminent list we created.

We ranked the top 200 of the 348 modern psychologists with a combination of awards, citation metrics, and textbook coverage. We also list individuals who scored highly on all three of the metrics, as well as those who scored high on two out the three metrics. Our methods borrowed from the bibliometric article by Haggbloom et al. (2002), who published a list of the most eminent psychologists of the 20th century. We broadened and refined their initial search methods, and updated their list. Whereas the list of Haggbloom et al. and other lists (Endler, Rushton, & Roediger, 1978; Griggs & Proctor, 2002; Simonton, 1992, 2000, 2002) featured classic figures in psychology, our list focuses on modern psychologists whose careers occurred primarily after World War II. Because our search included more recent sources, we were able to create a list of currently eminent psychologists. A few names have dropped somewhat in our list compared with that of Haggbloom et al.'s list (e.g., Neal Miller), and new names appear high in our list (e.g., Daniel Kahneman and Shelley Taylor) who did not appear on the earlier list. Similarly, names appear in the Haggbloom et al. list of persons who no longer appear in our list (e.g., Arthur Jensen). Our list is "modern" in that we focused on scientists whose careers have occurred primarily after 1956, the first year of the APA distinguished scientist award. Earlier lists included large numbers of people who careers were largely over before that time and therefore our list includes names that mostly do not appear on the earlier lists.

What do we mean by "eminent?" The idea reflects the degree of recognition, impact, and respect an individual has in the field. Although it correlates with "importance," this latter idea can probably best be judged only after a period of many years to gauge the long-term influence the scientist has exerted on the field. Thus, our list is not based on important contributions per se, which we did not assess, but rather current widespread recognition of the scientist and her or his works. As Haggbloom et al. (2002) point out, there are a number of different measures of eminence, and each focuses on different types of impact and recognition. For example, introductory textbook coverage reflects the degree to which textbook writers believe the work of a scientist is important, but also to some degree the extent to which they believe it will be interesting and understandable to students. Citation counts reflect the degree to which people within the person's research area recognize and cite his or her work, but do not always reflect the judgment of all of psychology. Awards reflect the judgments of other psychologists, but in some cases might be influenced by the area of study of nominees, as well as by social network patterns. Thus, although each measure of eminence has a degree of validity, each also has its limitations and range of focus. By combining three types of scores we hoped to overcome the shortcomings in each of the measures. We validated our eminence ratings against other metrics of eminence such as ratings by psychologists and Wikipedia coverage. However, we cannot stress enough that ours is not a list of the most important contributions to psychology, and opinions will vary substantially about the answer to that issue. The importance of contributions lies beyond our methods, and we seek only to identify psychologists who have high levels of current recognition in the field.

## Method

We relied on six sources to initially identify eminent psychologists. From this list of 348 individuals we used citation metrics, major awards, and coverage in introductory textbooks to rank the group in terms of eminence. The six sources we used to obtain the initial list of eminent psychologists were: (a) recipients of American Psychological Association (APA) award for distinguished scientific contributions ("The APA Award for Distinguished Scientific Contributions honors psychologists who have made distinguished theoretical or empirical contributions to basic research in psychology" http://www.apa.org/about/awards/scientific-contributions.aspx); (b) Association for Psychological Science (APS) winners of the William James Fellow award ("The APS William James Fellow Award honors APS Members for their lifetime of significant intellectual contributions to the basic science of psychology) http://www.psychologicalscience.org/index.php/members/awards-and-honors/fellow-award); (c) current psychologists in the National Academy of Sciences in the psychological and cognitive sciences category; (d) current psychologists of the American Academy of Arts and Sciences in the social, developmental psychology, and education category, as well as selected psychologists in the neurosciences, cognitive sciences, and behavioral biology category; (e) selected additional individuals from the Institute for Scientific Information's list of highly cited psychologists who seemed likely to have high eminence; and (f) additional individuals who were frequently mentioned in the five introductory psychology textbooks we analyzed. Although our list does not include all eminent psychologists, we are confident that it is likely to include the most eminent because they would certainly be identified by at least one of the six sources we employed. For example, Daniel Kahneman and Shelley Taylor appear in all six sources, and therefore had many routes through which to enter our initial group.

After collecting the initial list, we used three broad indicators as the criteria by which to assess eminence: (a) the APA award for Distinguished Scientific Contribution and the APS's William James Fellow Award; (b) the number of introductory psychology textbook pages on which the scientist is mentioned or cited in five texts; and (c) citation metrics (combining total citations, the h-index, and the highest-cited work for each scientist).

We counted award winners from the inception of the awards through 2013. The justification for using the APA and APS awards to assess eminence is that the two societies are the most recognized of

psychology bodies that cover all areas of scientific psychology. These societies rely on award committees who examine the records of many nominees. Thus, a person who wins one or both awards is likely to have made a substantial lifetime contribution to psychology, published much work that is respected by leaders in the field, and received widespread recognition for their work. The APA award was begun in 1956 and all of the scientists in our group (excluding the classic historical figures) lived past this date. The APS award began in 1989 and a number of our group of scientists had died previous to that point. In the case of an individual who died before 1989 but had already received the APA award, we gave credit for the APS award because individuals could not receive the award if they had died prior to its inception. We justified the deceased individuals' credit for the APS award because virtually all of the APA winners who were alive through 1989 did receive the APS award. Seventy-four of 76 of them did so, and thus it seemed that most of those dying before 1989 would have done so as well. We assigned imputed credit for the APS award to 32 individuals. Although not ideal because it gives credit to scientists who did not actually win the award, it appears that our proxy credit is a reasonable compromise because to not give credit for the award to scientists who had died before 1989 seems like it would unduly penalize many of them.

We collected citation data during November, 2012 through February, 2013. Citations are widely used to assess eminence because they reflect the degree to which other scientists cite the person's work. In some ways citation counts are the most valid single eminence metric because they reflect the degree to which other scientists who are familiar with the work cite it. Total citations reflect the person's impact taken as a whole, whereas the most highly cited article gives weight to a very important single article the person authored. The h-index is a combination of high-impact article and a large number of these. For example, Bruce McEwen had an h-index of 153; he had 153 publications that were each cited 153 or more times. Although criticisms are made of citation metrics (e.g., people being cited for doing something wrong; self-citations can inflate a person's numbers), most of them have limited relevance to our rankings. For example, the citation rates of our eminent group are so high that self-citations represent a small percentage of the total and cannot account for the very high numbers of our most eminent scientists.

There have been arguments made for the importance of each of our three citation metrics. Because arguments can be offered to support each metric, we used a combination of all three. We used Harzing's *Publish or Perish* program to count citations. It in turn relies on the counts in Google Scholar, which tend to be more inclusive than those in other sources. After the computer search, counting citations remained challenging because some scientists use different forms of their names in different publications, and there are often others with the same name. We tried various forms of names to identify which produced the most accurate counts (e.g., Ed Diener, Edward Diener, E Diener, and EF Diener). After the search, we combed through the titles of articles of scientists and attempted to delete those articles that were not his or her works. Some error is bound to occur in such an endeavor, especially in reference to total citations. Nevertheless, we believe that we were able to identify the scientist's publications in the vast majority of cases. Furthermore, the highest cited article and h-index are less subject to errors in accurately identifying all of a scientist's publications because it is usually clear when the most highly cited articles belong to that author or to another author with a similar name.

The number of textbook pages was used as the third metric because it is the degree to which introductory textbook writers, whose goal is

to reflect the important findings across the entire discipline of psychology, give recognition to a person's work. We counted all pages on which the scientist's name was mentioned in the index, including pages of references. The five introductory textbooks we consulted were Bernstein, Clarke-Stewart, Penner, Roy, and Wickens (2000); Myers (2010); Plotnik and Kouyoumdjian (2011); Schacter, Gilbert, and Wegner (2011); and Zimbardo, Johnson, and McCann (2009). We selected textbooks based on obtaining a broad representation of subdisciplines within psychology. Fourteen psychologists authored the texts we used, representing a broad spectrum of subdisciplines: cognitive, clinical, social, biological and neuroscience, and human factors psychology. We avoided several textbooks that were authored by very close personal friends. Finally, we sought texts that presented broad overviews of the entire field of psychology.

In several cases the textbook authors were members of our eminent psychologists list. We found that in this case the text they authored often devoted substantially more pages to their work than did the other texts. Thus, in this instance we used the mean number of pages in the other works rather than the number in their own text to use in their textbook page count.

The page scores in the five textbooks were substantially correlated with one another (mean $r = .49$, $p < .001$, range from $r = .41–.56$) providing a reliable summed index ($\alpha = .82$, and .85 when log 10 transformed). Griggs and Proctor (2002) analyzed 10 introductory psychology textbooks and reported the Top 60 highest impact researchers. Out of the top 60 researchers, 53 were in our list. Our textbook total pages were highly correlated with the data in Griggs and Proctor (2002), $r = .84$, $p < .001$. Considering the fact that over 10 years have passed since Griggs and Proctor's (2002) analyses, the high degree of congruence between our data and Griggs and Proctor's (2002) data suggests robustness of our textbook data. Introductory textbook pages have the strength of viewing the field from a broad perspective rather than scientists working within a focused area. On the other hand, they have the limitation that certain topics (e.g., statistics and methodology) are not covered in depth and therefore these counts tend to underestimate the importance of technical contributions.

The citation metrics and the introductory textbook pages both had highly positively skewed distributions, with a few individuals scoring very far above the mean. Thus, we computed the log10 of the pages and citation metrics to normalize the scores before averaging them. To average the citation metrics, and then the three overall metrics, we standardized the scores across the sample (the logged scores for citations and textbook pages), and then computed the mean of the standardized scores, first within the citation category, and then across the three categories (citations, pages, and awards). Based on these scores we rank-ordered the eminent psychologists in the sample. We also computed the scores without using the log transform, and the rank orders remained very similar.

Although each of the metrics we used is imperfect, each also has notable strengths. Citation metrics tend to favor those in larger fields because there are more journals and researchers in these fields to cite the target person. However, our awards metric tended to counterbalance this because the smaller fields in psychology also tend to be where the most rigorous methods are often possible, and therefore appear to receive heavy recognition from awards committees. People with technical contributions often score lower in textbook coverage, but they often tend to score high in citation counts. Thus, averaging our three metrics tended to balance out the strengths and weaknesses in each. It is also important to again remind readers that we are not

creating a list of the importance of people's work, but of eminence—the degree of widespread recognition in the field.

To further validate our rankings, we examined their association with two additional indicators for a subsample of the eminent list: We employed a count of the Wikipedia lines devoted to that scientist under the entry for his or her name. Most of those on our list have Wikipedia entries, and these vary from quite brief to very long. Lines of coverage in Wikipedia represent the degree to which people are interested in the scientist's work to the extent of being willing to spend time working on the entry. Another validity source we used was eminence ratings by 14 research psychologists.[1] The raters were all doctoral level psychologists, and 12 of them were professors at research universities. They represent diverse subdisciplines in psychology: clinical, social, organizational, developmental, personality, coaching, and measurement/quantitative. One of the raters is an introductory psychology textbook writer, and several of them have taught introductory psychology. Thus, the raters tend to represent different subdisciplines and tend to have broad knowledge of the field. To reduce the burden on the raters, we asked them to rate the eminence of five groups of scientists from different positions in our rankings. They rated top 10 and bottom 10 of the top 100, the top 10 and approximate bottom 10 of the second 100, and the approximate bottom 10 of the overall list. The exact ranks that comprised each group are shown in Table 4.

We also computed a list of "Complete Eminence" psychologists—those who scored above a high threshold on all three of the metrics. For this list we also obtained eminence ratings and Wikipedia line counts. In addition, we calculated for this group of eminent psychologists the degree to which their total citations have increased during the past year, to judge whether their eminence is rising or falling.

## Results

In Table 1 we present the eminence statistics for 12 classic figures in psychology. These are psychologists whose careers were essentially complete by the time of the first APA distinguished psychologist award in 1956. Many of these individuals are widely known and respected because of their historical importance to the field rather than because of their impact on current research and thinking. Sigmund Freud's impact metrics continue to outpace even the most eminent of modern scientists. However, the entire list has impressive metrics considering the years since their work occurred.

Table 2 presents the eminence metrics and rankings for the 100 individuals of modern psychology who scored highest overall in the mean average of the three metrics. Although none of these scored as highly as Freud, the metrics of most of them are continuing to grow at a rapid pace and therefore might soon surpass his. For example, citations of Albert Bandura grew by almost 35,000 citations in the past year alone. The growth rates point to the fact that our eminence rankings are dynamic and will change over time. The means and standard deviations for the figures shown in Table 2 are: awards 1.66 (.62); text pages 15.1 (11.7); total citations 52,042 (40,206); h-index 80 (29.2); and highest cited article 8,495 (7,257). It can be seen that for each of the metrics this group is highly distinguished. The median and mode values were smaller for the pages and citations metrics because the distributions for these metrics were highly positively skewed. Table 3 presents the next 100 eminent psychologists, and their rankings.

Although textbook pages and our overall citation metric correlated .55 ($p < .001$), awards did not correlate significantly with the other two metrics ($r$'s of −.07 and −.04). The log of the citation metrics correlated substantially with each other (citations total and h-index, .82; total and highest citation, .78; and h-index and highest, .37), with an overall Cronbach's alpha of .81 for their combination. Thus, although textbook pages and citations share substantial overlap, as do the citation metrics with each other, the award measure has much unique variance. It should be recalled, however, that among a representative sample of all psychologists that awards would likely correlate substantially with the other two measures. We assume that it is only within our restricted group of highly eminent individuals (and thus at the top tail of the range) that the association largely disappears. This is supported by the fact that individuals in our sample who won both awards had a mean of 31,190 citations and were mentioned on 7.2 text pages. Thus, those who had won both awards have much higher metrics than the average psychologist from a broad sample of all psychologists.

Might we have achieved different results using other textbooks or other citation search engines? Although specific rankings of individuals would have likely changed slightly for some people near each other in the list, it seems that overall our list would not have changed substantially. In terms of textbooks the five scores (log 10 transformed) taken together had a Cronbach's alpha of .85, and the average Cronbach's alpha when dropping any one of the texts was about .82. Thus, substituting other texts would not likely produce large changes in the rankings.

## Subject Areas of Eminent Psychologists

A method of examining the influence of subdisciplines on eminence is to analyze the numbers on our list from different areas of psychology. We labeled each scientist with one or two of 16 areas of psychology, and counted the numbers from different fields. Of the 505

Table 1

*Historical Great Persons of Psychology*

| Name | Text pages | Total citations | h-index | Highest cited publication |
|---|---|---|---|---|
| FREUD, Sigmund (1856–1939) | 86 | 298,407 | 237 | 8,070 |
| DARWIN, Charles (1809–1882) | 34 | 90,984 | 90 | 24,281 |
| JAMES, William (1842–1910) | 42 | 54,420 | 62 | 19,626 |
| JUNG, Carl (1875–1961) | 10 | 60,794 | 111 | 3,720 |
| THORNDIKE, Edward (1874–1949) | 9 | 22,003 | 53 | 3,949 |
| PAVLOV, Ivan (1849–1936) | 25 | 11,522 | 26 | 7,289 |
| WATSON, John B. (1878–1958) | 16 | 13,034 | 34 | 2,570 |
| TERMAN, Lewis (1877–1956) | 12 | 16,005 | 42 | 2,431 |
| VON FRISCH, Karl (1886–1982) | 2 | 5,471 | 27 | 1,330 |
| WUNDT, Wilhelm (1832–1920) | 16 | 7,921 | 39 | 1,055 |
| BINET, Alfred (1857–1911) | 13 | 7,080 | 39 | 720 |
| EBBINGHAUS, Hermann (1850–1909) | 12 | 4,192 | 17 | 2,110 |

Table 2
*100 Extremely Eminent Psychologists (Ranks 1–100)*

| Rank | Name | Awards | Text pages | Total citations | h-index | Highest cited article |
|------|------|--------|-----------|-----------------|---------|----------------------|
| 1 | BANDURA, Albert | 2 | 40 | 218,219 | 144 | 33,888 |
| 2 | PIAGET, Jean | 2 | 39 | 152,723 | 148 | 8,056 |
| 3 | KAHNEMAN, Daniel | 2 | 23 | 152,529 | 107 | 24,780 |
| 4 | LAZARUS, Richard | 2 | 25 | 96,379 | 101 | 24,110 |
| 5 | SELIGMAN, Martin | 2 | 47 | 67,789 | 97 | 7,691 |
| 6 | SKINNER, B. F. | 2 | 43 | 66,603 | 83 | 9,162 |
| 7 | CHOMSKY, Noam | 2 | 11 | 191,030 | 123 | 19,447 |
| 8 | TAYLOR, Shelley | 2 | 40 | 50,243 | 88 | 8,675 |
| 9 | TVERSKY, Amos | 2 | 13 | 134,651 | 96 | 24,295 |
| 10 | DIENER, Ed | 2 | 22 | 67,882 | 110 | 6,853 |
| 11 | SIMON, Herbert | 2 | 6 | 191,431 | 147 | 16,045 |
| 12 | ROGERS, Carl | 2 | 27 | 56,980 | 78 | 8,462 |
| 13 | SQUIRE, Larry | 2 | 24 | 54,809 | 114 | 3,508 |
| 14 | ANDERSON, John | 2 | 12 | 72,008 | 98 | 9,004 |
| 15 | EKMAN, Paul | 2 | 24 | 59,121 | 87 | 3,000 |
| 16 | TULVING, Endel | 2 | 22 | 46,137 | 88 | 4,195 |
| 17 | ALLPORT, Gordon | 2 | 15 | 50,316 | 67 | 15,083 |
| 18 | BOWLBY, John | 2 | 8 | 72,122 | 81 | 23,681 |
| 19 | NISBETT, Richard | 2 | 20 | 42,852 | 76 | 6,955 |
| 20 | CAMPBELL, Donald | 2 | 8 | 84,135 | 85 | 14,036 |
| 21 | MILLER, George | 2 | 11 | 53,526 | 73 | 15,711 |
| 22 | FISKE, Susan | 2 | 16 | 37,054 | 79 | 8,671 |
| 23 | DAVIDSON, Richard | 2 | 22 | 45,549 | 107 | 1,395 |
| 24 | MCEWEN, Bruce | 2 | 6 | 91,872 | 153 | 3,371 |
| 25 | MISCHEL Walter | 2 | 20 | 31,288 | 73 | 4,341 |
| 26 | FESTINGER, Leon | 2 | 10 | 49,677 | 54 | 21,077 |
| 27 | MCCLELLAND, David | 2 | 7 | 57,493 | 68 | 21,422 |
| 28 | ARONSON, Elliot | 2 | 31 | 22,720 | 67 | 2,054 |
| 29 | POSNER, Michael | 2 | 7 | 65,649 | 105 | 5,042 |
| 30 | BAUMEISTER, Roy | 1 | 36 | 55,303 | 108 | 5,685 |
| 31 | KAGAN, Jerome | 2 | 20 | 37,562 | 92 | 1,316 |
| 32 | LEDOUX, Joseph | 1 | 32 | 47,806 | 107 | 7,329 |
| 33 | BRUNER, Jerome | 2 | 3 | 105,935 | 111 | 9,721 |
| 34 | ZAJONC, Robert | 2 | 18 | 26,109 | 50 | 5,687 |
| 35 | KESSLER, Ronald | 0 | 37 | 132,839 | 175 | 10,720 |
| 36 | RUMELHART, David | 2 | 5 | 67,470 | 60 | 17,787 |
| 37 | PLOMIN, Robert | 1 | 39 | 44,783 | 104 | 2,672 |
| 38 | SCHACTER, Daniel | 1 | 37 | 47,112 | 109 | 2,374 |
| 39 | BOWER, Gordon | 2 | 10 | 27,881 | 77 | 4,755 |
| 40 | AINSWORTH Mary | 2 | 9 | 34,371 | 48 | 11,064 |
| 41 | MCCLELLAND, James | 2 | 5 | 49,109 | 77 | 8,263 |
| 42 | MCGAUGH, James | 2 | 8 | 37,777 | 95 | 2,300 |
| 43 | MACCOBY, Eleanor | 2 | 8 | 32,902 | 62 | 7,173 |
| 44 | MILLER, Neal | 2 | 15 | 20,811 | 55 | 3,588 |
| 45 | RUTTER, Michael | 1 | 9 | 102,356 | 164 | 4,233 |
| 46 | EYSENCK, Hans | 1 | 20 | 56,498 | 96 | 4,286 |
| 47 | CACIOPPO, John | 1 | 15 | 57,665 | 107 | 4,622 |
| 48 | RESCORLA, Robert | 2 | 11 | 17,277 | 59 | 4,272 |
| 49 | EAGLY, Alice | 1 | 25 | 36,664 | 69 | 7,010 |
| 50 | COHEN Sheldon | 1 | 18 | 45,037 | 84 | 6,930 |
| 51 | BADDELEY, Alan | 1 | 21 | 36,322 | 78 | 7,037 |
| 52 | BECK, Aaron | 0 | 20 | 134,080 | 112 | 24,625 |
| 53 | ROTTER, Julian | 2 | 8 | 29,069 | 34 | 14,760 |
| 54 | SMITH, Edward | 2 | 8 | 28,307 | 74 | 2,430 |
| 55 | LOFTUS, Elizabeth | 1 | 25 | 31,835 | 76 | 5,160 |
| 56 | JANIS, Irving | 2 | 6 | 32,469 | 56 | 4,922 |
| 57 | SCHACHTER, Stanley | 2 | 16 | 14,212 | 36 | 4,409 |
| 58 | BREWER, Marilynn | 2 | 7 | 27,324 | 74 | 2,198 |
| 59 | SLOVIC, Paul | 1 | 4 | 82,046 | 114 | 24,575 |
| 60 | STERNBERG, Robert | 0 | 51 | 66,953 | 122 | 3,382 |
| 61 | ABELSON, Robert | 2 | 4 | 27,158 | 62 | 9,884 |
| 62 | MISHKIN, Mortimer | 2 | 4 | 29,188 | 83 | 4,267 |
| 63 | STEELE, Claude | 2 | 11 | 19,824 | 33 | 3,376 |
| 64 | SHIFFRIN, Richard | 2 | 7 | 23,981 | 49 | 5,120 |
| 65 | HIGGINS, E. Tory | 2 | 4 | 32,473 | 83 | 3,121 |
| 66 | WEGNER, Daniel | 2 | 10 | 19,927 | 58 | 1,743 |

(*table continues*)

Table 2 (*continued*)

| Rank | Name | Awards | Text pages | Total citations | h-index | Highest cited article |
|------|------|--------|-----------|-----------------|---------|----------------------|
| 67 | KELLEY, Harold | 2 | 4 | 34,578 | 57 | 6,698 |
| 68 | MEDIN, Douglas | 2 | 7 | 20,880 | 66 | 2,434 |
| 69 | CRAIK, Fergus | 1 | 15 | 30,981 | 79 | 6,643 |
| 70 | NEWELL, Allen | 2 | 2 | 49,836 | 68 | 12,004 |
| 71 | HEBB, Donald | 2 | 7 | 22,797 | 28 | 16,154 |
| 72 | CRONBACH, Lee | 2 | 2 | 56,968 | 53 | 18,248 |
| 73 | MILNER, Brenda | 2 | 5 | 25,771 | 63 | 3,921 |
| 74 | GARDNER, Howard | 0 | 25 | 70,002 | 95 | 16,253 |
| 75 | GIBSON, James | 2 | 3 | 37,850 | 48 | 13,181 |
| 76 | THOMPSON, Richard | 2 | 6 | 23,743 | 79 | 1,484 |
| 77 | GREEN, David | 2 | 5 | 17,288 | 51 | 8,241 |
| 78 | BERSCHEID, Ellen | 2 | 10 | 17,169 | 47 | 2,048 |
| 79 | MARKUS, Hazel | 1 | 11 | 37,031 | 68 | 9,530 |
| 80 | JOHNSON, Marcia | 2 | 4 | 22,444 | 79 | 2,685 |
| 81 | HILGARD, Ernest | 2 | 7 | 18,312 | 54 | 2,238 |
| 82 | MASLOW, Abraham | 0 | 29 | 60,284 | 58 | 24,900 |
| 83 | DAMASIO, Antonio | 0 | 15 | 84,297 | 112 | 14,374 |
| 84 | ATKINSON, Richard | 2 | 7 | 13,256 | 42 | 5,062 |
| 85 | ERIKSON, Erik | 0 | 18 | 77,585 | 72 | 24,352 |
| 86 | BROWN, Roger | 2 | 4 | 24,330 | 41 | 7,427 |
| 87 | SPERRY, Roger | 2 | 12 | 11,487 | 42 | 1,377 |
| 88 | COHEN, Jonathan | 1 | 6 | 56,146 | 101 | 4,055 |
| 89 | ROSENZWEIG, Mark | 2 | 5 | 25,292 | 85 | 653 |
| 90 | TOLMAN, Edward | 2 | 9 | 11,475 | 37 | 3,336 |
| 91 | GREENWALD, Anthony | 1 | 12 | 30,492 | 70 | 4,215 |
| 92 | HARLOW, Harry | 2 | 6 | 16,794 | 57 | 1,745 |
| 93 | DEUTSCH, Morton | 2 | 4 | 27,911 | 47 | 3,428 |
| 94 | SPELKE, Elizabeth | 2 | 5 | 20,673 | 72 | 1,076 |
| 95 | GAZZANIGA, Michael | 1 | 17 | 20,531 | 70 | 2,443 |
| 96 | ROEDIGER, H. L. | 1 | 19 | 19,989 | 69 | 1,951 |
| 97 | GUILFORD, J. P. | 2 | 2 | 31,315 | 61 | 5,561 |
| 98 | HETHERINGTON, Mavis | 2 | 5 | 18,755 | 67 | 1,036 |
| 99 | PINKER, Steven | 0 | 37 | 39,495 | 65 | 7,287 |
| 100 | TREISMAN, Anne | 2 | 2 | 27,248 | 58 | 6,655 |

areas listed (some scientists being listed in more than one area), the most frequent was social psychology (16%), biological psychology (11%), and developmental psychology (10%). The number of eminent individuals was not always proportional to the numbers in each field. For example, sensation and perception had the same percent in our list as did clinical psychology (both were 8% of the list), despite being a much smaller field. Overall, the scientists are quite spread out across the 16 subdisciplines.

## Golden Age for Eminent Psychologists?

Could our rankings be biased by time, with more recent psychologists having an advantage because of their current salience, and because the numbers of journals and scientists were smaller in the past (with the result being lower citation counts)? Note, however, that scientists from earlier times have also had more years in which to have their work cited. Thus, those with a lasting influence should continue to be cited over time. We found a very small inverse correlation ($r = -.10$) between birth years of scientists and their overall eminence scores. Birth year correlated $-.60$ ($p < .001$) with awards, $.20$ ($p < .001$) with citations, and $.24$ ($p < .001$) with text pages. It appears that recency has small positive associations with text pages and citations, but a negative association with awards. Thus, our combined eminence scores seem to include metrics that cancel time effects when they are combined. It appears that younger scientists have not yet had time to build quite the level of eminence as older scientists in terms of awards, but their work is recognized in the other two metrics.

Should we calculate a yearly citation metric to be fairer to younger scholars? We did not do so because we are interested in overall impact rather than attempting to compute a metric of merit or productivity, or to predict the future. A young scientist might be prolific considering years since Ph.D., but this does not equate with overall eminence, which is recognition across the field. No matter how promising, young scholars are almost never as recognized as Piaget or Kahneman, for example.

We examined the validity of our eminence scores by analyzing their correlation with other metrics. In terms of the ratings made by 14 scientists the mean interrater agreement was $r = .85$ and the Cronbach's alpha for the summed rating score was .99. Thus, the ratings showed a high degree of interrater agreement and provided a very reliable score. In Table 4 we present the mean scores on the validity criteria for the five groups of scientists based on rankings.

As can be seen, the groups differed in close accord with the eminence rankings, with only the closely ranked Groups 2 and 3 showing any reversals. The mean ratings by psychologists correlated for the five groups $r = .97$ ($p < .01$) with our overall eminence score. For the 50 individuals in the five groups our overall eminence score correlated .60 ($p < .001$) with the log of lines in Wikipedia. Thus, our external validity criteria provided substantial support for our eminence scores.

Other studies also point to the validity of the metrics on which we relied (see Simonton, 2002, for a comprehensive review). For instance, Smith and Eysenck (2002) found that ratings of psychology departments made by review panels in the United Kingdom correlated .91 with the average citation rates of faculty members in those departments. Citation counts have also been shown to be associated with scientific awards (Endler, 1987). Baird and Oppenheim (1994)

Table 3

*100 Very Eminent Psychologists (Ranks 101–200)*

| | |
|---|---|
| 101 | RYAN, Richard |
| 102 | BARLOW, David |
| 103 | FRITH, Uta |
| 104 | ASCH, Solomon |
| 105 | SHEPARD, Roger |
| 106 | ATKINSON, John |
| 107 | COSTA, Paul |
| 108 | JONES, Edward |
| 109 | SPERLING, George |
| 110 | CASPI, Avshalom |
| 111 | EISENBERG, Nancy |
| 112 | GARCIA, John |
| 113 | HEIDER, Fritz |
| 114 | SHERIF, Muzafer |
| 115 | GOLDMAN-RAKIC, P. |
| 116 | UNGERLEIDER, Leslie |
| 117 | ROSENTHAL, Robert |
| 118 | SEARS, Robert |
| 119 | WAGNER, Allan |
| 120 | DECI, Ed |
| 121 | DAVIS, Michael |
| 122 | ROZIN, Paul |
| 123 | GOTTESMAN, Irving |
| 124 | MOFFITT, Terrie |
| 125 | MAIER, Steven |
| 126 | ROSS, Lee |
| 127 | KOHLER, Wolfgang |
| 128 | GIBSON, Eleanor |
| 129 | FLAVELL, John |
| 130 | FOLKMAN, Susan |
| 131 | GELMAN, Rochel |
| 132 | LANG, Peter |
| 133 | NEISSER, Ulrich |
| 134 | CSIKSZENTMIHALYI, Mihalyi |
| 135 | MERZENICH Michael |
| 136 | MCCRAE, Robert |
| 137 | OLDS, James |
| 138 | TRIANDIS, Harry |
| 139 | DWECK, Carol |
| 140 | HATFIELD, Elaine |
| 141 | SALTHOUSE, Timothy |
| 142 | HUTTENLOCHER, J. |
| 143 | BUSS, David |
| 144 | MCGUIRE, William |
| 145 | CARVER, Charles |
| 146 | PETTY, Richard |
| 147 | MURRAY, Henry |
| 148 | WILSON, Timothy |
| 149 | WATSON, David |
| 150 | DARLEY, John |
| 151 | STEVENS, S. S. |
| 152 | SUPPES, Patrick |
| 153 | PENNEBAKER, James |
| 154 | MOSCOVITCH, Morris |
| 155 | FARAH, Martha |
| 156 | JONIDES, John |
| 157 | SOLOMON, Richard |
| 158 | SCHEIER, Michael |
| 159 | KITAYAMA, Shinobu |
| 160 | MEANEY, Michael |
| 161 | PROCHASKA, James |
| 162 | FOA, Edna |
| 163 | KAZDIN, Alan |
| 164 | SCHAIE, K. Warner |
| 165 | BARGH, John |
| 166 | TINBERGEN, Niko |
| 167 | KAHN, Robert |
| 168 | CLORE, Gerald |
| 169 | LIBERMAN, Alvin |

Table 3 (*continued*)

| | |
|---|---|
| 170 | LUCE, Duncan |
| 171 | BROOKS-GUNN, Jeanne |
| 172 | LUBORSKY, Lester |
| 173 | PREMACK, David |
| 174 | NEWPORT, Elissa |
| 175 | SAPOLSKY, Robert |
| 176 | ANDERSON, Craig |
| 177 | GOTLIB, Ian |
| 178 | BEACH, Frank |
| 179 | MEEHL, Paul |
| 180 | BOUCHARD, Thomas |
| 181 | ROBBINS, Trevor |
| 182 | BERKOWITZ, Leonard |
| 183 | THIBAUT, John |
| 184 | TEITELBAUM Philip |
| 185 | CECI, Stephen |
| 186 | MEYER, David |
| 187 | MILGRAM, Stanley |
| 188 | SIEGLER, Robert |
| 189 | AMABILE, Teresa |
| 190 | KINTSCH, Walter |
| 191 | CAREY, Susan |
| 192 | FURNHAM, Adrian |
| 193 | BELSKY, Jay |
| 194 | OSGOOD, Charles |
| 195 | MATTHEWS, Karen |
| 196 | STEVENSON, Harold |
| 197 | UNDERWOOD, Brenton |
| 198 | BIRREN, James |
| 199 | KUHL, Patricia |
| 200 | COYNE, James |

review the evidence for the validity of citation measures, and conclude that they are reliable but should be used along with other measures.

The two awards we used could be supplemented by other honors such as the Grawemeyer Award given at the University of Louisville. Although this is a prestigious award and given to any area of psychology, it is relatively new so that very few scientists have yet received it. Furthermore, the award is given for a single good idea, not for overall eminence. The national Medal of Freedom has been awarded so far to only 15 psychologists, and they came from only a few areas of scientific psychology. Thus, these other awards do not provide a broad basis for determining eminence in psychology. The two awards we employed were in agreement 76% of the time, with only 24% of individuals having earned one award but not the other. This discrepancy percentage is likely to drop in the future because many of those who have won one of the awards are likely to be awarded the other. Thus, the two awards we used converge with each other and appear to be the strongest we could have used.

Some are skeptical of Google Scholar citation counts because they are higher than other counts, for example those based on Web of Science searches. However, it should be noted that although the Google counts are higher, this does not mean that they do not provide the same relative ordering of individuals. Because we computed the log of citation metrics and then standardized these scores, the overall level did not make any difference to the rankings. To confirm this we searched the Web of Science database for 25 individuals spread throughout our ranked list. We used people with unusual names (e.g., Zajonc) so that false positives and negative would be less likely. The log of citation counts for these 25 individuals correlated with the log of counts produced by the Harzing *Publish or Perish* program, $r = .88$ ($p < .001$), which is remarkable given that the Web of Science database does not include all of the sources covered by Google Scholar. The log of the h-indices from the two databases correlated, $r = .83$ ($p < .001$). Thus, it appears that replacing any of the eminence

Table 4
*Group Means for Eminence Criteria and External Validity Metrics*

| Eminence groups | Mean text pages | Standardized citation index (mean of 3 metrics) | Mean awards | Mean Wikipedia lines | Ratings of eminence by psychologists |
|---|---|---|---|---|---|
| 1 (Ranks 1–10) | 30.3 | 1.66 | 2.0 | 168 | 6.8 |
| 2 (Ranks 91–100) | 10.9 | .19 | 1.5 | 51 | 5.5 |
| 3 (Ranks 101–110) | 10.6 | .33 | 1.1 | 38 | 5.3 |
| 4 (Ranks 191–200) | 3.8 | .15 | .7 | 12 | 4.0 |
| 5 (Ranks 339–348) | .1 | −1.40 | .2 | 12 | 3.2[*] |

*Note.* Based on Ranks 338 and 340–348.

metrics we used with alternative sources would have been likely to produce only small changes in the rank orderings. Although the Web of Science searches produced much lower citation metrics, they provided very similar relative-position information.

## A Few Mega-Impact Articles or Many High-Impact Articles?

Eminence was not usually based on a few very important publications. Among the highest ranked scientists publications were often in the hundreds and sometimes exceeded 1,000. Furnham and Sternberg, for example have over 1,100 and 1,200 publications, respectively. This echoes Simonton's (1988) observation that a characteristic of genius in the sciences is immense productivity. Indeed, after analyzing 10 eminent psychologists' publication records, Simonton (2002) concluded "the most direct route to success is a high level of raw productivity. Individuals who produce more have better odds of producing a high impact work" (p. 77). The most eminent scientists often work late into life and never fully retire from their work. This pattern suggests that these individuals very much enjoy research. Even after additional research would not add to their fame or incomes, most continued to vigorously conduct it. Because many of the eminent individuals live into their 90's (e.g., Jerome Bruner), the years in which they are involved in scholarship extends over 50 or 60 years. The average age for those on the list who have died is 80.2. Given that this group was primarily men born at a time when the average longevity was much lower, the scientists appear to on average live long. Indeed, the average underestimates the longevity of the group because the longest living scientists are mostly still alive, and well over 80.

The average age of being awarded the APA award for distinguished scientific contribution is 59, and only one person (Meehl) earned the award in his 30's. Several luminaries won the award in their 40's (e.g., Kahneman and Festinger), but most won the award in their 50's, 60's, and 70's. Because of the large amount of work over many years to achieve eminent status, it appears that the majority in the group very much enjoy doing research and are not motivated solely by extrinsic rewards such as money and recognition.

## Institutional, Gender, and Other Biases?

To what degree is institutional affiliation important to eminence in psychology? Previous research showed that biologists, political scientists, and psychologists at a major university are more likely to receive major professional awards and fellowships (e.g., Guggenheim) than equally productive researchers at a less prominent university (Crane, 1965). We thus examined the undergraduate institutions, the Ph.D. institutions, and the institutions at which the scientists worked during their careers. A few doctoral programs contributed disproportionately to the education of those on our list. Of the scientists for whom we could identify graduate programs, the top five

(Harvard, University of Michigan, Yale, Stanford, and the University of Pennsylvania) trained 38%. Forty-five scientists earned their doctorates at Harvard (13% of the entire list). The top 10 doctoral programs (which also included the University of California at Berkeley, University of Minnesota, Columbia University, the University of Chicago, and the University of Texas) accounted for 55% of the entire list.

Because there are approximately 285 doctoral programs in the United States, it is remarkable than only 10 could account for the education of over half of the most eminent psychologists. The impression is confirmed by analyses of Gini coefficients of the number of eminent psychologists produced by institutions. Gini coefficients are used by economists to reflect income inequality. The Gini can vary from 0 (everyone earns exactly the same income) to 1.0 (one individual earns all of the income). As points of comparison, Scandinavian countries have Gini coefficients in the .20's, The United States is in the .40's, and the most unequal nations are in the .60's. The Gini coefficient for the number of eminent psychologists educated at various undergraduate institutions was .76, and for doctoral training it was .80! Thus, the training of eminent psychologists is extremely unequal, with a few institutions producing the majority of them. However, it should be noted that the scientists did come from a total of 78 institutions, and therefore many graduate departments of psychology have trained at least one eminent psychologist. In addition, there is a time trend toward greater democratization. In the cohort born in 1936 or earlier, 38% received their Ph.D. at an Ivy League college, whereas in the cohort born in 1937 and after only 21% did so.

The undergraduate institutions of our eminent psychologists were broader, and included small liberal arts and state colleges. In this case the top five programs (Harvard, University of Michigan, City University of New York, Stanford, and University of California at Berkeley) accounted for 20% of the education of those on our list. Although obviously disproportionate, this reflects greater equality across schools for bachelor's degree education.

Where do the eminent psychologists spend their careers? As might be imagined, virtually all of them work in prominent research universities, with a few working in research organizations or the private sector. A large number of eminent psychologists work at several different universities during their careers, but a large percentage of them remained at only one university throughout their careers. Almost nobody on the list worked at a liberal arts college or state college (4-year colleges without a substantial research component) for the majority of their careers. A large number of eminent psychologists at some point in their careers worked at highly prestigious institutions. For example, from our list 50 worked at Harvard, 30 at Stanford, 27 at University of Pennsylvania, 27 at University of Michigan, and 25 at Yale at some point in their careers. Thus, over a third of our list has worked at one of five prestigious universities at some point in their post-Ph.D. careers.

Although there is a sign that the impact of female psychologists has been growing over the last few decades (Griggs, Jackson, Christopher, & Marek, 1999), Cikara, Rudman, and Fiske (2012) lamented the "thousand small cuts" that slow women's progress in academic psychology. Has progress been made over the period we studied? If we count the number of eminent women in our list we find that there were eight women out of 79 in the cohort of psychologists born before 1921 (10%). This very low percentage reflects the fact that women found it difficult to be accepted to graduate programs, were virtually excluded from having professorships in universities, and usually served as research associates or assistants (Evans, 1999). Among those born from 1921 through 1950 there were 47 women out of 210 psychologists (22%). Among those born in the most recent period from 1951 to 1965 there were 15 women out of 55 psychologists (27%). Although the numbers are small and therefore somewhat unreliable, it does not appear that substantial progress was made after the initial period in which women were allowed to take professorships. A large upsurge of women into psychology has occurred during the last three decades, and women now comprise 75% to 80% of psychology majors. Women now comprise 76% of psychology doctoral students, or three times as many women as men. Thus, 27% is a very low percent in a field that is strongly dominated by women in terms of numbers. Thus, it will be important to monitor in future years whether there is the expected large uptick in women among eminent psychologists, as they age to the point at which scientists achieve eminence. The fact that women make up only about a quarter of our list, in a field which is now predominantly female, is a significant concern.

The number of underrepresented ethnic minorities in our list is even lower than those for women. We recognized five: one Asian (Kitayama), one Hispanic or Latino (Garcia), and three African Americans (Jackson, Sidanius, and Steele). Even if we have failed to recognize some individuals as minorities, the percent in our list is disturbingly low.

Our eminence criteria metrics were highly positively skewed, with a few individuals scoring much higher than others and many bunched at the lower end, with skew scores of: overall citations, 3.05; textbook pages, 2.00; and Wikipedia lines, 2.90. Awards were not skewed (−.07). Thus, eminence tends to be highly skewed, with a few individuals scoring very highly, and many scoring together in a lower group who nonetheless still have impressive scores. This skewing tends to carry across various measures of eminence, except for awards in this elite sample. Thus, a select few scientists are cited very frequently, discussed much in textbooks, and described at length in Wikipedia.

## Countering Biases in the Metrics

Each of the eminence metrics has its own strengths and weaknesses, but some of these might affect certain individuals or disciplines more than others. There are two ways of attempting to control these biases. First, we can counter the unfair advantage a few might receive from a single exceptionally high metric by analyzing the metrics for those reaching a certain relatively high threshold on all three measures. The threshold approach counters the problem that some can end up being high on the list because they score particularly highly on one of the measures. For instance, a researcher with particularly interesting research might receive more textbook coverage, or a person with a statistical article might receive extremely high citations for that single article. However, if one must be above-threshold on each of our three metrics, this counters the possibility that a high ranking is merely due to one very high score. Thus, we examined people who had won both of the awards, as well as scored in the top decile both for text pages and for citations.

Table 5

*Scientists Ranking Highly on all Three Metrics (N = 7; Winner of Both Awards and in Top Decile on Both Pages and Citations)*

| Name | Wikipedia lines | Ratings by psychologists | One-year citation growth |
|---|---|---|---|
| BANDURA, Albert | 172 | 6.58 | 34,894 |
| PIAGET, Jean | 463 | 6.75 | 21,250 |
| KAHNEMAN, Daniel | 180 | 6.58 | 16,951 |
| LAZARUS, Richard | 49 | 5.58 | 13,882 |
| SELIGMAN, Martin | 107 | 5.67 | 13,400 |
| SKINNER, B. F. | 319 | 6.75 | 7,594 |
| DIENER, Ed | 126 | | 14,732 |

The second approach counters the problem that some might score low on one metric because of their field rather than because of their personal eminence. For instance, the text page metric can be low for people developing methodological and statistical techniques, and the citation metric is likely to be low for those working in smaller fields such as sensation/perception. To counter this problem one can analyze each individual's top two metrics and drop from consideration their lowest metric.

We created a "complete eminence" group of those scoring above a high threshold by taking all scientists who had won both awards and then selecting among them those who were in the top decile (Ranks 1 to 35) of both textbook pages and citations. In Table 5 we present those seven individuals who scored high on all three metrics. We asked several questions about these "complete-eminence" individuals: (a) Does their eminence extend to the Internet world? That is, although active scholars might recognize them, are others interested in their work?; (b) How do these individuals score when rated for eminence by psychologists? Do ratings confirm the eminence of these "complete eminence" scientists?; and (c) What is the trajectory the eminent scientists' citations—is it increasing, remaining stable, or decreasing? Some individuals might have high total citations, but their research could be declining in interest.

Twelve of the same raters that rated the groups also individually rated the complete eminence group (they did not rate the senior author of this article). Included with the complete eminence group were additional individuals from toward the top, middle, and bottom of the original list of 348 eminent names. These additional individuals were included in the ratings so that the raters did not feel a need to differentiate within the highly eminent group even if they did not perceive much difference. As can be seen in the table, the Internet world highly recognizes our complete eminence list in that they receive extensive coverage in Wikipedia. Second, we can see that the raters give the group high eminence scores. All are rated as very to extremely eminent. Skinner and Piaget top these ratings. There was strong convergence of our overall eminence score based on the three metrics with the psychologists' ratings of the 27 individuals who we had rated ($r = .82, p < .001$).

We computed the increase in citation counts for scientists by conducting a second search 90 days after the first one. We then used a compounding formula to estimate the current annual rate of growth in citations. In Table 5 it can be seen that our highly eminent group is increasing rapidly in citation counts. Indeed, the annual increase in citation counts for each person in our complete eminence group is greater than most researchers' lifetime citation counts. This is a case of the rich getting richer, perhaps because once one achieves eminence, the exposure leads to even greater eminence. In any case, if we were to examine eminence again in a few years it appears that our highly eminent group will have

Table 6

*Scientists Ranking Highly on Two Metrics (N = 29; Metrics Based on Winning Both Awards, Ranked in Top 35 in Pages, and Top 35 in Citations)*

ANDERSON, John
ARONSON, Elliot
BAUMEISTER, Roy
BECK, Aaron
BOWLBY, John
BRUNER, Jerome
CAMPBELL, Donald
CHOMSKY, Noam
DAVIDSON, Richard
EKMAN, Paul
GARDNER, Howard
KAGAN, Jerome
KESSLER, Ronald
LEDOUX, Joseph
MASLOW, Abraham
MCCLELLAND, David
MCEWEN, Bruce
MILLER, George
MISCHEL, Walter
NISBETT, Richard
POSNER, Michael
ROGERS, Carl
RUMELHART, David
SIMON, Herbert
SQUIRE, Lawrence
STERNBERG, Robert
TAYLOR, Shelley
TULVING, Endel
TVERSKY, Amos

distanced themselves even further from the average in terms of metrics such as citations.

We present in Table 6 scientists who score highly when two metrics are considered rather than all three. A number of individuals in the list do not score as highly when three metrics are considered because they have not won the psychology awards, in a number of cases probably because they are not by training psychologists (e.g., Kessler). Some have not yet won both awards but will undoubtedly do so in the future. Others score low on the summed three metrics because they do not have heavy textbook coverage, for example Donald Campbell, whose work is not usually covered in depth at the introductory level. All of the individuals in Table 6 do score in our Top 100 eminence list, and they would have scored even higher on that list if one of the metrics were not used. The extremely high eminence of this group reveals that no single metric perfectly reflects eminence, in as much as these individuals score very highly on two of the metrics, but less highly on a third one.

In Table 7 we present the most cited articles of the 348 eminent psychologists. Although limited to authorship by our list of scientists, it seems likely that this list includes most of the highly cited articles in scientific psychology. Certain "stars" stand out as having contributed multiple papers to the list, such as Chomsky, Simon, and Bandura. The breadth of psychology is attested to by the diversity of topics covered in the most cited articles.

## Discussion

We identified many eminent scientists in modern psychology, although there are undoubtedly eminent individuals whom we have omitted. To those individuals who we missed, we apologize. We know that there are a great many highly respected and important researchers who our list unfortunately omits. Nonetheless, we believe that our list is relatively comprehensive in terms of capturing the majority of the

most eminent scholarly psychologists. We again caution readers that our metric of eminence signifies that the person has widespread recognition in the field, but it is not a rating of the importance of the scientists' work, a judgment beyond our mission and ability.

Our list of classic historical figures in psychological sciences reveals several things. First, Freud continues, despite a lesser current interest in his theories, to hold first place in terms of citations and textbook coverage. Thus, Freud is still the most eminent person in the

Table 7

*Top 50 Highest Citation Publications of the Eminent Psychologists (Only Eminent List Authors Shown)*

| | Eminent author(s) | Topic | Citation count |
|---|---|---|---|
| 1. | Baron & Kenny | Moderator and mediator statistics | 35,894 |
| 2. | Albert Bandura | Social foundations of thought and action | 33,888 |
| 3. | Albert Bandura | Self-efficacy and control | 27,271 |
| 4. | Abraham Maslow | Motivation and personality | 24,900 |
| 5. | Kahneman & Tversky | Prospect theory | 24,780 |
| 6. | Kahneman, Slovic, & Tversky | Judgment under uncertainty | 24,701 |
| 7. | Aaron Beck | Scale for assessing depression | 24,625 |
| 8. | Erik Erikson | Childhood and society | 24,352 |
| 9. | Lazarus & Folkman | Stress, coping, and appraisal | 24,110 |
| 10. | John Bowlby | Separation and attachment | 23,681 |
| 11. | Albert Bandura | Self-efficacy theory | 23,531 |
| 12. | Bandura & McClelland | Social learning theory | 21,422 |
| 13. | Leon Festinger | Cognitive dissonance | 21,077 |
| 14. | William James | Principles of psychology | 19,626 |
| 15. | Noam Chomsky | Theory of syntax | 19,447 |
| 16. | Lee Cronbach | Reliability and coefficient alpha | 18,248 |
| 17. | David Rummelhart | Learning representations | 17,787 |
| 18. | Howard Gardner | Multiple forms of intelligence | 16,253 |
| 19. | Donald Hebb | Neuropsychology | 16,154 |
| 20. | Herbert Simon | Organizations | 16,045 |
| 21. | Herbert Simon | Administrative behavior | 15,736 |
| 22. | George Miller | Working memory plus or minus two | 15,711 |
| 23. | Gordon Allport | Prejudice | 15,083 |
| 24. | Erik Erikson | Identity: Youth and crisis | 14,837 |
| 25. | Julian Rotter | Locus of control | 14,760 |
| 26. | Peter Bentler | Statistical fit indices | 14,505 |
| 27. | Antonio Damasio | Descartes' error | 14,374 |
| 28. | Donald Campbell | Experimental and quasi-experimental designs | 14,036 |
| 29. | Herbert Simon | Artificial intelligence | 13,802 |
| 30. | Fritz Heider | Balance and interpersonal relations | 13,691 |
| 31. | Noam Chomsky | Government binding | 13,539 |
| 32. | Donald Campbell | Quasi-experimentation | 13,274 |
| 33. | James Gibson | Ecological approach to perception | 13,181 |
| 34. | Noam Chomsky | Syntactical structures | 13,040 |
| 35. | Aaron Beck | Cognitive therapy for depression | 12,393 |
| 36. | Noam Chomsky | Minimalist program of syntax | 12,311 |
| 37. | David Watson | Measure of affect | 12,059 |
| 38. | Newell & Simon | Human problem solving | 12,004 |
| 39. | Robert Kahn | Psychology of organizations | 11,846 |
| 40. | Deci & Ryan | Intrinsic motivation | 11,836 |
| 41. | Mary Ainsworth | Patterns of attachment | 11,064 |
| 42. | Charles Osgood | Dimensions of language meaning | 10,892 |
| 43. | Donald Campbell | Convergent and discriminant validity | 10,861 |
| 44. | Kessler & McGonagle | Rates of mental disorders | 10,722 |
| 45. | Robert Abelson | Knowledge structures; plans and scripts | 9,884 |
| 46. | Peter Bentler | Comparative fit indices | 9,833 |
| 47. | Jerome Bruner | Acts of meaning | 9,721 |
| 48. | Leon Festinger | Social comparison | 9,678 |
| 49. | Markus & Kitayama | Culture and the self | 9,632 |
| 50. | Noam Chomsky | Sound patterns in English | 9,394 |

field of psychology, even though his framework has lost much of its currency. The other classic figures continue to be of historical influence and their work is frequently covered in textbooks. However, they are no longer frequently cited in scientific publications.

We are confident that our list reflects the general level of renown of most of the psychologists on the list. However, there are a few individuals who seem to us as though they should score higher. Each reader will have her or his opinions about certain scientists who seem out of place, ranked either too high or too low. Yet, overall the list seems to capture our judgments in most cases. The scientists who are on our list of eminence read like a Who's Who of psychology. Not only do we recognize the names of these individuals and usually know of their findings, but they are highly cited by others, are given prestigious awards, and their findings are described in textbooks. Nonetheless, exact rankings should not be overinterpreted because small differences in the metrics can move an individual quite a few ranks. In addition, as Table 6 revealed, people may score somewhat differently depending on which metrics are used. Thus, our eminence rankings can be taken as a general indicator of eminence rather than as an exact score.

One bias in our rankings of eminence is that they rely on sources that give heavy weight to Americans, or at least to English speakers. The awards were granted by American societies and the textbooks were written by American authors. Thus, our eminence rankings do not fully cover the entire world. There are nine individuals on our Top 100 list who spent most or all of their careers working outside of the United States. Nonetheless, our rankings undoubtedly give too little credit to scientists outside the United States, and this should be remedied in future studies. Another limitation is that our rankings include only scholarly psychologists, and do not pertain to the eminence of applied psychologists. Thus, we are confident that those on our list are eminent, but we are also certain that our list omits eminent applied psychologists.

One challenge in creating a list of eminent psychologists is that the field cannot be clearly set off from related disciplines. Because the field of psychology has fuzzy boundaries, one cannot definitely demarcate who is and is not a psychologist. For instance, Freud, Darwin, and Pavlov made important contributions to psychology, but none were by training or affiliation psychologists. This definitional problem cannot be solved with exactitude. However, our list overcomes this problem to some extent by reliance on the sources we used—the awardees of psychological societies, the psychology categories of elected societies, psychology textbooks, and Science Citation Index's list of most highly cited psychologists. Thus, we did not pick the psychologists, but others did so. Individuals such as Chomsky might be considered psychologists by some and not by others, because he was not by training or affiliation a psychologist, and yet his contributions fell clearly into the behavioral domain. Similarly, there are people, for example neuroscientists, who have made large contributions to psychology but are not in the sources and therefore not in our list (e.g., Eric Kandel). Thus, our list is incomplete in the sense that it misses people who have made contributions related to psychology, but who have not won awards in the field, and so forth.

One issue that we faced is that we counted citations over a period of 3 months, thus giving some advantage to those assessed later in the process because they had more time in which to accumulate citations. In most cases this had only a trivial effect on overall citation counts. In the case of a few individuals whose citation metrics are rapidly rising, it could have some effect. This can be seen in Table 2 by examining the highest cited article of Kahneman and of Tversky. This is the identical article, but it received different counts because of the separation in dates of the searches for the two individuals. Kahneman and Tversky have citations that are rising very rapidly, faster than all but a few other psychologists. Yet, the difference in the two counts for the article in question is only about 2%. Thus, differences in the dates on which we conducted counts

would have made only very small differences in our citation numbers. Thus, this source of error is likely to have made only a tiny difference in most people's rankings.

One fact we learn from the eminence scores is that there are a few people who score extremely highly, and thus create highly positively skewed distributions. The extreme eminence and importance of a very small number of leaders in scientific fields has been known for many years. For instance, Cattell (1910) suggested that it "can be argued with plausibility that the progress of sciences depends exclusively on the few men of genius" (p. 682). This statement is certainly too extreme in that the great breakthroughs by the most eminent scientists are built on the earlier work of other less famous individuals. It should be noted that there is also a well-known phenomenon in science as Matthew effect that "a scientific contribution will have greater visibility in the community of scientists when it is introduced by a scientist of high rank than when it is introduced by one who has not yet made his mark" (Merton, 1968, p. 4). That is, an already famous researcher gets disproportionately large credit for the same idea or concept proposed with less famous researchers. Despite this bias, it is clear that some psychologists have had many more great ideas than others. Indeed, the individuals at the top of our rankings often singly have a higher citation count and textbook pages devoted to them than most entire departments of psychology.

The most eminent psychologists in our rankings were not only extremely prolific, but they forged new directions, or defied "the crowd" (Sternberg, 2006). Bandura did not merely study social learning, but he championed a more cognitive approach to learning than was dominant when he began his work. Piaget forged new ground in exploring the understanding of children. Kahneman championed a view of decision making that departed from the dominant approach, and Chomsky departed from a purely instrumental learning view of language. In each case these and most others who are high on the list went against a dominant tradition and were not afraid to propose ideas that seemed heretical at the time.

The eminent psychologists also tend to work on a core set of questions and do not conduct research across many scattered areas. Although they often combine areas of psychology in their studies, they tend not to study many different phenomena. Thus, the eminent psychologists conduct a very large number of studies on a limited set of questions. Equally important, eminent psychologists tend to write well (Simonton, 2002). From Sigmund Freud and William James (see Table 1) to Michael Gazzaniga and Steven Pinker (see Table 2), highly-cited psychologists are capable of communicating complex ideas well to fellow scientists as well as lay people. Merton (1968) describes the scientific contribution as follows: "For science to be advanced, it is not enough that fruitful ideas be originated or new experiments developed or new problems formulated or new methods instituted. The innovations must be effectively communicated to others. That, after all, is what we mean by a *contribution* to science" (p. 4).

Another finding we learn from our ratings is that although women in psychology initially made progress once they were allowed access to graduate schools and professorships, it appears that they have not continued to make substantial progress after that point. We found only a slightly higher percentage of eminent women in the 1951 to the present cohort than in the 1921–1950 cohort. Our sample of younger eminent women is small and therefore our conclusions are uncertain. Nonetheless, this issue should be examined in other samples where the criteria for eminence are less extreme so that more scientists from younger cohorts are available for study. Given that women now receive the majority of doctorates in psychology we hope that the future will see many more women at the highest levels of eminence.

Another major concern is the infrequency of ethnic minorities in our list. Although African Americans, Asians, and Latino/Hispanics have

made progress in society in terms of human rights, they are extremely underrepresented in our list. Five of 348 scientists is an extremely low number. It is shocking that only slightly more than 1% of our eminent list was made up of three major ethnic minorities in a society in which these groups comprise 34% of the population. In part this appears to result from the fact that so few minorities are drawn to graduate work in psychology. Guthrie (1998) reported that the elite Departments of Psychology between 1920 and 1966 awarded over 3,700 doctoral degrees, but only eight of this group were given to African Americans. During the period when many of our eminent scientists would have received their Ph.D.'s, extremely few Blacks did so. Clearly, efforts need to be made to attract, retain, and reward minorities and women into research institutions. Further, educating these groups from an early age about the rewards of scientific research might also be helpful in attracting them to scientific careers.

We learn from our lists that eminence rarely comes early in life in psychology. The youngest person on our list was 48, and the youngest person in the Top 100 rankings was 58. The mean age for receipt of the APA award is 59.3. The youngest living person who has won the APA award is age 56 (Sapolsky). Twenty-two persons won the APA award in their 70's, and two in their 80's. Thus, the highest levels of eminence in psychology rarely come early in life. A few individuals achieved eminence with a few famous articles, but the vast majority of them have a large number of articles with high citation counts (see Simonton, 2002). The publications of those high on the list are not counted in dozens, but in hundreds. It is rare to achieve high eminence in psychology by producing a few breakthrough articles. A student who is motivated by recognition or money rather than the love of research might find it difficult or impossible to keep up this level of productivity for decades.

Why do a few institutions educate such a disproportionate number of eminent scientists? It is likely that several influences are at work, including the high ability and motivation of those attending the most selective doctoral programs, as well as contact with leading scientists to mentor one's work. A few eminent scientists, however, have attended less prestigious doctoral programs and there is a trend toward more democratization in the Ph.D. training of psychologists.

Working at a prestigious institution also seems helpful on the path to eminence (see also Crane, 1965). Although to some degree eminent individuals move to elite institutions after they achieve eminence, it also seems likely that having access to the resources, contacts, and recognition of an elite institution helps to increase eminence. The lower teaching loads at most elite universities, as well as the better facilities, also probably play a role in the high research productivity at them.

Is eminence many different things or is there a unitary core concept? We factor-analyzed (maximum-likelihood factor analysis) three major indicators for the 27 individuals for whom we had psychologists' ratings. We included in our analysis the ratings, the overall citation metric, and number of text pages. The result was a single strong factor that accounted for 87% of the variance in the scores. The individual factor scores were: ratings, .86; overall citation score, .94; and text pages, .89. The metrics correlated from .77 to .84 with each other. These results suggest that although different dimensions of eminence exist, there is an overall core eminence value as well. Although there are differences among the eminence measures, they also all seem to be strongly influenced as well by an underlying general eminence factor. However, no single metric is an infallible indicator of this underlying factor.

Our list of eminent psychologists points to the road to eminence as being one of hard work over a long number of years. Very large numbers of publications as well as forging new directions seem necessary for the highest levels of eminence, and receiving doctoral training at an elite institution is very helpful. It appears that the field of scientific psychology

is in need of greater democratization not only in education, but in encouraging the research of women and ethnic minorities.

There is no favored topic area or subdiscipline for reaching eminence—our most eminent list includes people from diverse subfields, addressing diverse topics with diverse methods. An encouraging conclusion that can be drawn from the list of most eminent psychologists is that the field has made large advances and is making important new discoveries. From the work of people such as Kahneman and Tversky, Shelley Taylor, Larry Squire, Elizabeth Loftus, Susan Fiske, Michael Posner, and Richard Davidson we can see that psychologists and neuroscientists have learned important new things about human behavior. This raises the issue of whether it might be time for a Nobel award in psychology.

## References

Annin, E. L., Boring, E. G., & Watson, R. T. (1968). Important psychologists, 1600–1967. *Journal of the History of the Behavioral Sciences, 4,* 303–315. doi:10.1002/1520-6696(196810)4:4<303::AID-JHBS2300040402>3.0.CO;2-B

Baird, L. M., & Oppenheim, C. (1994). Do citations matter? *Journal of Information Science, 20,* 2–15. doi:10.1177/016555159402000102

Bernstein, D. A., Clarke-Stewart, A., Penner, L. A., Roy, E. J., & Wickens, C. D. (2000). *Psychology.* Boston, MA: Houghton Mifflin.

Cattell, J. M. (1910). A further statistical study of American men of science. *Science, 32,* 672–688. doi:10.1126/science.32.828.672

Cikara, M., Rudman, L., & Fiske, S. (2012). Dearth by a thousand cuts? Accounting for gender differences in top-ranked publication rates in social psychology. *Journal of Social Issues, 68,* 263–285. doi:10.1111/j.1540-4560.2012.01748.x

Crane, D. (1965). Scientists at major and minor universities: A study of productivity and recognition. *American Sociological Review, 30,* 699–714. doi:10.2307/2091138

Endler, N. S. (1987). The scholarly impact of psychologists. In D. N. Jackson & J. P. Rushton (Eds.), *Scientific excellence: Origins and assessment* (pp. 165–191). Newbury Park, CA: Sage.

Endler, N. S., Rushton, J. P., & Roediger, H. L. III (1978). Productivity and scholarly impact (citations) of British, Canadian, and U.S. Departments of Psychology (1975). *American Psychologist, 33,* 1064–1082. doi:10.1037/0003-066X.33.12.1064

Evans, R. B. (1999). A century of psychology: Once behind the scenes, now in the fore. *APA Monitor, 30,* 14–28.

Griggs, R. A., Jackson, S. L., Christopher, A. N., & Marek, P. (1999). Introductory psychology textbooks: An objective analysis. *Teaching of Psychology, 26,* 182–189. doi:10.1207/S15328023TOP260304

Griggs, R. A., & Proctor, D. L. (2002). A citation analysis of Who's Who in introductory textbooks. *Teaching of Psychology, 29,* 203–206. doi:10.1207/S15328023TOP2903_04

Guthrie, R. V. (1998). *Even the rat was white: A historical view of psychology* (2nd ed.). Boston, MA: Allyn & Bacon.

Haggbloom, S. J., Warnick, R., Warnick, J. E., Jones, V. K., Yarbrough, G. L., Russell, T. M., . . . & Monte, E. (2002). The 100 most eminent psychologists of the 20th Century. *Review of General Psychology, 6,* 139–152. doi:10.1037/1089-2680.6.2.139

Merton, R. K. (1968). The Matthew effect in science: The reward and communication systems of science are considered. *Science, 159,* 56–63. doi:10.1126/science.159.3810.56

Myers, D. G. (2010). *Psychology.* New York, NY: Worth.

Plotnik, R., & Kouyoumdjian, H. (2011). *Introduction to psychology.* Belmont, CA: Wadsworth.

Schacter, D. L., Gilbert, D. T., & Wegner, D. M. (2011). *Introducing psychology.* New York, NY: Worth.

Simonton, D. K. (1988). *Scientific genius: A psychology of science.* Cambridge: Cambridge University Press.

Simonton, D. K. (1992). Leaders of American psychology, 1879–1967: Career development, creative output, and professional achievement. *Journal of Personality and Social Psychology, 62,* 5–17. doi:10.1037/0022-3514.62.1.5

Simonton, D. K. (2000). Methodological and theoretical orientation and the long-term disciplinary impact of 54 eminent psychologists. *Review of General Psychology, 4,* 13–24. doi:10.1037/1089-2680.4.1.13

Simonton, D. K. (2002). *Great psychologists and their times: Scientific insights into psychology's history.* Washington, DC: American Psychological Association. doi:10.1037/10466-000

Smith, A. T., & Eysenck, M. (2002). *The correlation between RAE ratings and citation counts in psychology.* Department of Psychology, University of London, London, UK.

Sternberg, R. J. (2006). The nature of creativity. *Creativity Research Journal, 18,* 87–98. doi:10.1207/s15326934crj1801_10

Zimbardo, P. G., Johnson, R. L., & McCann, V. (2009). *Psychology: Core concepts.* Boston, MA: Pearson Education.