

## Chapter 11. Maturity and Aging

*Once a psychologist's career begins, how does it develop? How does the career of a great psychologist differ from those of less illustrious colleagues? What place does marriage and family have in a highly accomplished career? Does one's personal life have to be sacrificed for professional attainment? And what happens at the end? Are great psychologists blessed with lives not just productive, but long besides?*

Granville Stanley Hall is often considered a “champion of firsts.”

In 1878 he received the first doctorate in psychology to be bestowed in the United States (under William James).

- He then became the first American student in the first year of the first psychology laboratory anywhere in the world (with Wilhelm Wundt).
- Next, in 1883, Hall himself established the first working psychology laboratory in the United States (in contrast to that of James, which was used for teaching rather than research).
- In 1887 Hall began the publication of the *American Journal of Psychology*, the first psychological journal in the United States as well as the first English-language journal devoted entirely to psychology.
- The following year he became the first president of the Clark University, helping to make it one of the centers of graduate education in the field.
- In 1892, he helped found the American Psychological Association, and became its first president.
- Even a few years before his death, Hall continued his participation in important firsts. In 1920, Francis Cecil Sumner, Hall's last graduate student, became the first African American to earn a doctoral degree in psychology in the United States.

Hall is also widely considered a pioneer in developmental psychology.

- In 1893, he had founded the *Pedagogical Seminary* (later the *Journal of Genetic Psychology*), the first journal in the fields of educational and child psychology.
- Yet Hall made it clear during the course of his long career that he was fascinated by far more than child development. On the contrary, he strove to achieve a truly life-span developmental perspective.
- He published his epochal two-volume book *Adolescence* in 1904, and in 1922 published another work called *Senescence*, a pioneering study in gerontology. Because Hall was then 78 years old, it is clear that his developmental studies not just spanned a whole human lifetime, but spanned his whole life besides.

What Hall's example shows is that our inquiry into great psychologists must not stop with the last chapter. Development does not cease once someone leaves home or graduates from the university. Accordingly, in the present chapter I will examine what happens to the notables of psychology's history as they mature and age.

- I begin with a discussion of how their careers typically develop.
- Once the trajectory of their professional life is thus described, I can look at what is most likely happening “behind the scenes,” in their personal life.
- I then close the chapter by discussing that final stage of development that marks the psychologist's own final chapter, when the professional and personal lives must face the ever-growing prospect of death.

## CAREER DEVELOPMENT

- If the goal is to continue where chapter 10 left off, then part of that task has already been accomplished. In chapter 4 I reviewed what researchers have learned about how productivity – both quantity and quality – changes across the life span.
- From the standpoint of posterity, this creative output is the most crucial aspect of the career.

Still, career development does not consist exclusively of simply publishing one thing after another. Most eminent contributors must earn a living besides.

- In the case of most research psychologists, this living consists of a position at a major university.
- Besides advancing up the academic ladder, such professors will also take on doctoral students, to train the next generation of psychologists.
- Furthermore, psychologists of all kinds, whether researchers or practitioners, may engage in various kinds of organizational activities, such as founding journals or becoming officers in professional associations.
- Of course, the really best researchers and practitioners will also find themselves the recipient of various awards and honors.
- But eventually, the final years will arrive. The most active part of the career comes to a close, and the long-lived psychologist may enter a period of retirement, however nominal.

G. S. Hall's career displays some of these features of career development.

- After getting his PhD under James at 34, he joined the faculty at Johns Hopkins University at 38.
- He founded his first journal, the *American Journal of Psychology*, at age 43, and his second, the *Pedagogical Seminary*, when he was 47.
- At age 45 he became president and professor of psychology at Clark University.
- At both Johns Hopkins and Clark Hall became an active mentor to students, and by age 54 had produced more than half of the psychology PhDs in the United States.
- Between ages 42 and 55 Hall conferred doctoral degrees upon such future notables as Joseph Jastrow, William Henry Burnham, Edmund Sanford, William Lowe Bryan, Henry Donaldson, and Henry Goddard.
- He was 48 when he became the first president of the American Psychological Association.
- As president of Clark and as one of the founders of APA, Hall demonstrated his excellent organizational skills.
- These appeared again at age 65, when he arranged for Sigmund Freud to deliver an address at Clark as part of the university's 20th anniversary celebrations. Freud brought along other psychoanalytic luminaries, such as Carl Jung, Sandor Ferenczi, and Ernest Jones, while the contingent of great American psychologists included Edward Titchener, William James, Carl Seashore, and James McKeen Cattell.
- Nonetheless, despite this professional triumph, Hall's career was showing signs of decline.
- His editorship of the *American Journal of Psychology* had allowed him to antagonize many of his colleagues with his opinionated and undiplomatic critiques of their work.
- When Hall was 50 a rival journal appeared, the *Psychological Review*, under the leadership of James Mark Baldwin and James McKeen Cattell.
- This obliged Hall to share *AJP* editorial responsibilities with co-editors and an editorial board.
- Furthermore, his research interests had begun to take a curious turn. At age 60 he founded the *American Journal of Religious Psychology and Education* which, unlike his first two journals, did not endure, lasting only a decade.
- And, at age 73, Hall published *Jesus, the Christ, in the Light of Psychology*, a subject likely to be perceived as sacrilegious by the lay public and eccentric by fellow psychologists.
- Three years later he retired from Clark, and by the time he wrote *Senescence* at age 78, Hall's own career was almost senescent.
- His autobiography was published one year later, and his death at age 80 followed shortly after.

There is no question that Hall secured a significant place in psychology's history. But to what extent is this career trajectory representative of great psychologists in general?

In addressing this question, of course, adjustments must be made for various altered circumstances.

- Certainly psychologists who attained distinction as clinicians in private practice – such as Freud, Hall's 1909 dignitary – will not exhibit the same pattern of academic achievements.
- Furthermore, the specific pattern of career onset, climax, and termination may vary according to the magnitude of greatness a psychologist manages to attain.

Fortunately, there already exists sufficient empirical research to permit a pretty reliable sketch of the expected career course.

### *Onset and Ascent*

Right from the start it is apparent that Hall was atypical in one critical respect: His career as a psychologist got off to a late start.

- The delay was the consequence of his having originally planned to enter the ministry.
- To this end, at age 23 he had entered Union Theological Seminary in New York City, from which he graduated at age 26.
- Then having decided to pursue an academic career instead, he worked hard to raise the necessary money, so he did not begin his graduate studies until age 32.

It is more typical of both great scientists and great psychologists to make the final career choice at a younger age than did Hall.

- Roe's (1952) 64 eminent scientists were most likely to make the decision to become researchers during their undergraduate education.
- A large-sample study of 860 scientists starred in *American Men of Science* found that about half decided to become a scientist before age 18 (Visher, 1947). Moreover, 30% had already determined their scientific specialty before attending college, while another 50% had made that determination during college. Only 5% were more than 30 years old by the time the scientist began pursuing the area in which he or she would attain eminence.
- In addition, within the particular domain of psychology, the more eminent contributors tended to chose a career in psychological research at a younger age than those less eminent (Chambers, 1964).

Although Hall took more time than most distinguished psychologists to launch his career, he at least wasted little time once his new path was chosen.

- It took him only a couple of years to earn his doctoral degree.
- Furthermore, in other aspects Hall may follow the norm more closely.

Below I examine two facets of early career development: fast advancement and elite affiliation.

#### *Fast advancement.*

- Back in chapter 10 it was noted that the more distinguished scientists tend to complete their higher education at unusually young ages.
- And in chapter 4 it was observed that those luminaries also tend to make contributors to their fields at precocious ages.

Therefore, it would seem that exceptional scientists should exhibit accelerated career progress as well. As James McKeen Cattell (1910) said, "a man of genius is likely to do his work at an early age and to receive prompt recognition. Kelvin was appointed full professor at Glasgow at 22, Thomson at Cambridge at 26, Rutherford at McGill at 27" (p. 645).

Although not quite so dramatic, Cattell's assertion has been confirmed for academic researchers.

- Among American Nobel laureates, for example, 36% had attained a full professorship by age 34;
- the corresponding figure for members of the National Academy of Sciences is 25%, and
- for scientists honored with entries in *American Men of Science* 32% (Zuckerman, 1977).
- In contrast, only 29% of the laureates had to wait until they were 40 or older, in comparison to 39% of the NAS members and 42% of those featured in *American Men of Science*.

These figures imply that the higher is an individual's standing as a great scientist, the higher is the likelihood that he or she will achieve a full professorship within a decade or less.

Although I know of no empirical studies that specifically address this issue within psychology, it is clear that many of the discipline's notables also became full professors by age 34. Table 11.1 offers examples. Even G. S. Hall can be said to fit this pattern if it is defined in terms of career age rather than chronological age: Although Hall was promoted to full professor at age 40, that promotion took place only a half dozen years after earning his PhD.

Of course, as always, there exist exceptions to the general rule (e.g., Wilhelm Wundt)

**Table 11.1**

***Precocious Full Professors in the History of Psychology***

<b>Age</b>	<b>Individuals</b>
<b>34</b>	<b>F. Brentano, F. C. Donders, K. S. Lashley</b>
<b>33</b>	<b>N. Chomsky, G. T. Fechner, H. Simon</b>
<b>32</b>	<b>J. F. Herbart, O. Külpe, C. L. Morgan, K. P. Moritz</b>
<b>31</b>	<b>J. G. Fichte, J. Loeb</b>
<b>30</b>	<b>E. Brücke, K. Ludwig, J. Piaget, E. L. Thorndike, J. B. Watson</b>
<b>29</b>	<b>E. Kraepelin, J. Müller</b>
<b>28</b>	<b>J. M. Cattell, H. Helmholtz, E. Titchener, C. von Wolff</b>
<b>27</b>	<b>R. H. Lotze, I. Newton, K. Pearson, J. L. Vives</b>
<b>26</b>	<b>F. W. Bessel, E. Mach</b>
<b>25</b>	<b>F. Nietzsche,</b>
<b>24</b>	
<b>23</b>	<b>B. Rush, E. H. Weber</b>

*Elite affiliation.*

Exceptions like Wundt notwithstanding, great psychologists who pursue academic careers should advance quickly from assistant professor to associate professor to full professor (or their functional equivalents, depending on the particular university system).

Yet this is not the only way that a disciplinary luminary can display upward mobility.

There is also a striking tendency for illustrious psychologists to end up having positions at prestigious institutions as well.

- For example, American psychologists who are honored with election to the National Academy of Sciences hail predominately from Harvard, California, Stanford, Yale, Pennsylvania, Chicago, Michigan, MIT, and Rockefeller (Over, 1981).
- Most psychologists attain a job at an elite research university right from the outset of their career, based on the quality of their graduate school, the distinction of their mentor, and the quality and quantity of their creative output (Helmreich et al., 1980; Rodgers & Maranto, 1989).
- But others work their way up from lesser institutions, arduously earning their upward mobility by the impact of their research record (Gupta, Gilbert, & Pierce, 1983).

Table 11.2 offers some representative examples for notable figures in various European and American universities.

**Table 11.2**

***Representative Affiliations at Distinguished Universities***

- Austria:** University of Vienna (1791-1938) – Prochaska, Brücke, Meynert, Breuer, Exner, Brentano, Meinong, Ehrenfels, Mach, Benussi, K. Bühler, C. Bühler, Brunswik, Frenkel-Brunswik.
- Canada:** University of Toronto (1890-1976) – Baldwin, Jones, Brett, Berlyne.
- Czech Republic:** University of Prague (1818-1939) – Purkinje, Mach, Hering, Stumpf, Ehrenfels, Lindworsky.
- France:** University of Paris (Sorbonne, 1793-1969) – Lamarck, Cabanis, Cousin, Esquirol, Flourens, Broca, Bernard, Charcot, Richet, Ribot, Beaunis, Binet, Lapicque, Janet, Lévy-Bruhl, Dumas, Bryan, Durkheim, Delacroix, Piéron, Wallon, Guillaume, Merleau-Ponty, Piaget, Berlyne.
- Germany:** University of Berlin (1809-1948) – Fichte, Hegel, Schopenhauer, Beneke, J. Müller, Schelling, Steinthal, Du Bois-Reymond, Pflüger, Dilthey, Fritsch, Bernstein, Helmholtz, Lazarus, Kries, Erdmann, Ebbinghaus, König, Bryan, Dessoir, M. Weber, Schumann, Stumpf, Hornbostel, Nagel, Pflungst, Ziehen, Ach, K. Bühler, Gelb, Wertheimer, Köhler, Spranger, Lewin, Von Neumann, Jaensch, Duncker, Müller-Freienfels.
- Great Britain:** Cambridge University (1871-1957) – Maxwell, Ward, Stout, Whitehead, Rivers, McDougall, Myers, Yule, Burt, Bartlett, Fisher.
- Holland:** University of Utrecht (1852-1922) – Donders, Zwaardemaker, Ziehen, Michotte, Révész.
- Hungary:** University of Budapest (1908-1946) – Révész, Ferenczi, Békésy.
- Italy:** University of Turin (1814-1922) – Rolando, Lombroso, Kiesow, Ponzo, Gemelli.
- Russia:** Moscow State University (1888-1979) – Sechenov, Kornilov, Blonskii, Teplov, Rubinshtein, Luria, Leont'ev.
- Switzerland:** University of Zurich (1849-1965) – Ludwig, Wundt, Hitzig, Avenarius, Forel, Meumann, Frey, Bleuler, Jung, Störring, Abraham, Schumann, Hess, Henri, Lennenberg.
- United States:** Harvard University (1847-1967) – Agassiz, Brown-Séguard, Bowditch, James, Peirce, Royce, Münsterberg, Delabarre, Franz, Cannon, Holt, Urban, Yerkes, Bridgman, Langfeld, Dearborn, Elliott, Troland, F. Allport, C. L. Morgan, McDougall, Boring, Beebe-Center, Whitehead, G. W. Allport, Crozier, Rhine, Prince, Hull, Kelley, Cantril, Sachs, Wells, Lashley, Kluckhohn, Werner, Stevens, Goldstein, Sheldon, C. T. Morgan, Mowrer, F. H. Sanford, Stouffer, Békésy, Olds, Lennenberg.

The tendency illustrated in the table also applies to G. S. Hall, albeit in a more complex manner.

- Hall's first academic appointment was at Johns Hopkins, a distinguished academic institution that would eventually attract many great psychologists, including James Mark Baldwin, Christine Ladd-Franklin, John B. Watson, Adolf Meyer, W. Horsley Gantt, Hans Selye, and Clifford Thomas Morgan.
- Yet after only a half dozen years, and having only four years to enjoy his full professorship, Hall took the risky decision to join a brand new university, Clark, that had no reputation whatsoever, good, bad, or mediocre.
- Yet as professor and as college president, Hall managed to recruit many distinguished faculty, even stealing a few psychologists from Johns Hopkins.
- Hence, in this sense, Clark University owed its elite status in psychology's history to Hall's professional influence.
- What Hall gained from the affiliation was the unique opportunity to exercise that influence.

Needless to say, association with prestigious institutions is not confined to psychology's notables. Great scientists, in general, tend to be affiliated with the elite research universities (Poffenberger, 1930; Zuckerman, 1977).

At the same time, inquiries conducted by sociologists of science suggest that such affiliations operate in a complex fashion. Two complexities deserve mention here:

1. The prestige of the affiliation bears an inverse connection with the speed that a scientist can advance through the academic system. Those top scientists who are affiliated with a less prestigious university can attain a full professorship more quickly. This differential was disclosed in a study of American Nobel laureates in the sciences (Zuckerman, 1977). For institutions below the top tier, nearly half were promoted to full professor by age 34, in comparison to one third for those at the most prestigious universities. Similar differentials are found for NAS members and those honored by biographies in *American Men of Science*.
2. The linkage between a researcher's eminence and the institution's distinction is partly causal in nature. Scientists who ascend to a more distinguished research institution tend to increase their publication rates substantially, whereas those who show downward mobility tend to decrease their output (Allison & Long, 1990). This difference reflects the fact that the elite universities place more emphasis on research, and therefore provide more resources and encouragement for increased activity (Manis, 1951). Among the more common means to nurture research is to provide lighter teaching loads (Fulton & Trow, 1974).

These two findings introduce a certain dilemma for young, ambitious psychologists: "big fish in a small pond" versus "little fish in a big pond."

### *Climax*

Once important research programs get launched in a sufficiently supportive environment, researchers will find that their visibility in the discipline will steadily grow.

- One of the ways this growth appears is in the psychologist's participation in professional conventions and conferences.
  - For instance, Harvey Lehman (1953b) conducted a study of those psychologists who participated in the 1948 annual convention of the American Psychological Association. The modal age for those participants reading papers was 34, whereas that for those involved in symposia or who delivered invited addresses was 45.
  - Presumably, within a decade's time they had gone from having to submit papers for evaluation by the program committee to receiving invitations from colleagues and program chairs.

Eventually, this professional visibility will reach a point that the psychologist will be said to have reached the peak of his or her career.

This career acme will have three main features:

1. disciplinary esteem,
2. professional service, and
3. teaching impact.

### *Disciplinary esteem.*

In modern times, awards and honors are bestowed upon those who attain greatness as scientists. Nowadays, the ultimate form of recognition are the Nobel medals bestowed each year for major contributions to physics, chemistry, physiology or medicine, and, more recently, economics.

- Typically, this honor comes about a dozen years after the award-winning work appears (Manniche & Falk, 1957).
- Accordingly, the award is usually bestowed when the recipient is in the late 40s or early 50s, albeit there exists considerable variation across scientific domains (Moulin, 1955).
- In terms of mean ages at time of award, physicists are around 49 years old, chemists about 52, and bio-medical researchers approximately 55 (Shin & Putnam, 1982).

Unfortunately, there exists no Nobel for psychology.

- The only notables in psychology's history to receive this honor did so for either economics (Simon) or, more commonly, physiology (Pavlov, Békésy, and Sperry).
- Nonetheless, it is possible to give a rough estimate of when great psychologists would earn the Nobel were one available for their discipline.
- Among those scientists starred in *American Men of Science*, mathematicians and physical scientists were usually so honored in their late 30s, whereas the bio-medical scientists were more likely to receive that distinction in their late 40s (Visher, 1947).
- The starred psychologists had a mean age of "stardom" almost exactly between these two extremes.
- This would imply that the Nobel Prize for Psychology, were one to exist, would have the highest probability of being granted to psychologists who were around 50 years old.

Nonetheless, the four figures in psychology's history who actually became laureates ranged from 55 to 68, with a mean and median in the early 60s.

The number of relevant cases is too small to say with any confidence whether this age differential represents some statistical fluke.

Happily, psychology has its own special means to recognize its own.

One obvious example is the Distinguished Scientific Contributions Award given out by the American Psychological Association since 1956, when it was bestowed on Wolfgang Köhler, Carl Rogers, and Kenneth Spence.

On the average, those so honored are about 25 years into their career, or somewhere in their early 50s (Lyons, 1968; Wispé & Ritter, 1964).

Not only this later than the norm for the Nobel, but it is also somewhat delayed relative to other honors.

In comparison to APA's highest scientific award, those psychologists elected to the National Academy of Sciences are about 4 years younger and those honored with the Howard Crosby Warren Medal (of the Society of Experimental Psychologists) are usually about 6 years younger (Lyons, 1968; Wispé & Ritter, 1964).

On the other hand, there are other honors that great psychologists must usually wait longer to receive.

Those invited to contribute to the *History of Psychology in Autobiography* (e.g., Murchison, 1936) are most often 38 years into their career (Lyons, 1968), and those honored the Gold Medal of the American Psychological Foundation are about 50 years into their career (Wispé & Ritter, 1964), or chronological ages of about 64 and 76, respectively.

Oddly, J. M. Cattell (1910), when speaking of his own research on great scientists, said that "nearly all the men obtain recognition between the ages of 30 and 45" (p. 645). This interval is much earlier than those just given. Perhaps Cattell was thinking of lesser honors, along the lines of the various awards granted by the separate divisions of the American Psychological Association. These exceptions aside, it is clearly the case that most psychologists cannot expect to earn the highest levels of disciplinary recognition until after chronological age 45, or about two decades into their careers.

*Organizational service.*

G. S. Hall was the recipient of no really major awards for scientific achievement.

To be sure, he died long before he could have received APA's Distinguished Scientific Contributions Award, yet there were other honors available in his day.

For example, Hall's mentor, William James, was elected to the National Academy of Science, and so were several of Hall's younger colleagues, such as J. M. Cattell – but Hall was not.

In all likelihood, Hall's research was simply not up to that level. Nevertheless, it is evident that he made some signal contribution to the development of psychology as a discipline. If otherwise, he would not have been chosen to be APA's first president. More critically, his first election can be considered an explicit acknowledgment of Hall's organizational skills.

Hall's leadership is reflected in the quick success of the new organization.

Hall's presidency was followed by a series of distinguished successors.

- A short list of his successors must include figures like William James, J. M. Cattell, Josiah Royce, Edward Thorndike, Lewis Terman, L. L. Thurstone, Edward Tolman, Edwin Guthrie, and Donald T. Campbell.
- The list includes illustrious representatives of psychology's major schools and subdisciplines: the schools include functional (John Dewey and Harvey Carr), behaviorist (John B. Watson and Clark Hull), Gestalt (Wolfgang Köhler), and humanistic (Carl Rogers and Abraham Maslow); the subdisciplines include psychobiological (Karl Lashley, Robert Yerkes, and Harry Harlow), cognitive (Jerome Bruner and George A. Miller), psychometric (J. P. Guilford and Anne Anastasi), developmental (Robert Sears and Albert Bandura), personality and social (Gordon Allport and T. M. Newcomb), clinical and counseling (Paul Meehl and Leona Tyler).
- Also listed are some of the women who have figured most prominently in American psychology, like Mary Calkins, Margaret Washburn, Florence Denmark, and Janet Spence.
- Although the APA membership most often elected native-born psychologists, several foreign-born dignitaries grace the succession, including Hugo Münsterberg, Wolfgang Köhler, and D. O. Hebb.
- The list even includes some major contributors to the history of psychology as a specialty: J. M. Baldwin, Walter Pillsbury, E. G. Boring, Gardner Murphy, and Ernest Hilgard.

Hence, the APA presidency may be counted as one of Hall's most significant historical legacies.

- In terms of career development, a psychologist is most likely to be elected to the APA presidency around age 50.
- Curiously, Hall's successors tended to follow him in terms of the chronological age in which they were most likely to be elected president.
- Hall was 48, only a bit younger than the mean of 50 for those elected between 1901 and 1975 (Shin & Putnam, 1982).
- In terms of career age, however, Hall was much younger than the norm, namely 14 years rather than the usual 20 years (Wispé & Ritter, 1964).
- Yet this may reflect the fact that between Hall and more recent times, APA presidents have tended to be older upon election to the office (Lyons, 1968; Zusne, 1976b).
- Thus, in the first decade of APA's existence, the mean age for assuming the presidency was in the early 40s, an average that increases fairly steadily until it reached the late 50s by the 1970s (Zusne, 1976b).
- Or, expressing the historical shift in terms of career age, up to 1928 the average age at election was 14 – making Hall absolutely typical – but this figure increased to 20 years into the career for those elected between 1929 and 1966 (Lyons, 1976).

This upward shift in the age of organizational leaders by no means unique to the American Psychological Association.

Harvey C. Lehman (1953a) demonstrated the existence of a consistent trend in the same direction as an organization transforms from upstart to establishment.

- In the United States, for instance, this historical trend toward more elevated ages occurs for senators and representatives from 1799 to 1925, for members of the president's cabinet from 1789 to 1945, the heads of federal bureaus and services from 1775 to 1945, the justices of the Supreme Court from 1789 to 1925, for ambassadors to major foreign powers from 1789 to 1900, and for army commanders and chiefs of staff from 1775 to 1945.
- Furthermore, because the age increment is a decade or more, this trend cannot be attributed to increases in human life expectancy (Simonton, 1994a).
- Rather, it seems that older institutions require or attract more mature leaders.
- Ironically, Lehman (1953a) noted that these trends flatly contradict a claim that Hall (1922) had made in *Senescence*: "Perhaps the world is a little too much in the hands of people who are a little too old, but this is being rapidly remedied" (p. 135).
- Even more ironic is the fact that Hall himself was elected to his second term as APA president shortly after making this claim – as an octogenarian!

Speaking of other organizations, it is instructive to compare the APA presidency with similar positions in other institutions of a similar nature.

Judging from the data, the membership of APA appears to prefer youth over maturity when they cast their ballots.

- In contrast to the mean age of 50, somewhat older means are found for other professional societies.
- In particular, the following mean chronological ages are obtained for the following presidencies: the American Statistical Association, 52; the American Pharmaceutical Association, 54; the American Sociological Association and the Botanical Society of America, 56; the American Political Science Association, 57; the American Economic Association, the American Dental Association, and the American Chemical Society, 58; the American Medical Association, 61; the Geological Society of America, 62; and the American Society of Civil Engineers, 65 (Shin & Putnam, 1982).
- Not one has a lower mean age for electing their presidents.
- Furthermore, this preference for more youthful organizational heads is not confined to the APA presidency, but rather seems to hold for other psychological associations.
- Specifically, the following median career ages have been found: APA Division presidents, 14; Presidents, Psychometric Society, 17; presidents of various US regional psychological associations (e.g., Midwestern PA), 18; Chairs, Society of Experimental Psychologists, 22 (Lyons, 1968; also see Wispé & Ritter, 1964).
- These figures contrast greatly with the mean career age of 36 that holds for those elected President of the American Association for the Advancement of Science (AAAS), more than 15 years older than the typical APA president (Wispé & Ritter, 1964; also see Zusne, 1976b).

Even so, not all psychological associations exhibit the same proclivity.

Presidents of the International Congress of Psychology are most likely to be at career age 39, a mean much closer to that for AAAS presidents than for APA presidents (Wispé & Ritter, 1964).

Hall's assumption of the APA presidency was not the only way he displayed organizational leadership. His service as president of Clark University must be considered, too.

This happened at chronological age 45 (or career age 11).

James Rowland Angell, was somewhat older when he became president of Yale University, namely 52.

Both figures are well within the chronological ages most often found for university and college presidents in the United States (Lehman, 1953; Shin & Putnam, 1982).

For top institutions like Berkeley, Michigan, Chicago, Stanford, and the Ivy League universities, the average chronological age is around 51, the means ranging between 45 and 52 (Shin & Putnam, 1982).

Moreover, Hall's somewhat younger age relative to Angell's can be explicated in terms of the fact that Clark was a brand new university upon Hall's presidency, whereas Yale was over two hundred years old under Angell's.

So far, Hall's organizational activities appear to follow a fairly commonplace trajectory for great psychologists.

According to the empirical literature, his two significant presidencies – Clark and APA – came at career and chronological ages that were well within the statistical norms.

Nevertheless, two significant aspects of Hall's organizational leadership cannot be placed in a proper nomothetic context.

1. Hall was not just APA president, but played a leading role in APA's foundation. This Hall accomplished when he was in his late 40s. This chronological age falls pretty close to the median. At age 44 Harry Stack Sullivan helped found the Washington School of Psychiatry, at age 47 Jacob Moreno established the Beacon Hill Sanatorium, at age 52 Carl Stumpf founded the Society for Child Psychology and Anna Freud founded the Child Therapy Course and Clinic, and at age 53 Robert Yerkes established the Yale Laboratories of Primate Biology. At the same time, there are instances of organizational innovations that occurred with the instigator was much younger or older than was Hall at the time of APA's birth. On the youthful end of the spectrum, at 33 Karl Abraham organized the Berlin Psychoanalytic Society, at 35 Otto Rank founded the publishing house Der Internationale Psychoanalytische Verlag, at 37 Edward Titchener founded the Society of Experimental Psychologists (as a rival to APA), and at about age 40 Plato founded his Academy in Athens. On the older end, James McKeen Cattell founded the Psychological Corporation in his late 50s, Hans Selye founded the International Institute of Stress when 70, and Leta Stetter Hollingworth established the Psychological Laboratories at Barnard College in her mid 70s.
2. Besides Hall's contributions to Clark and APA, he founded journals, most notably the *American Journal of Psychology*, which he initiated at age 43. This figure also seems to conform fairly closely to the norm, at least according to my own subjective impressions. Other journal founders or co-founders who were likewise in their 40s include Hermann Ebbinghaus (*Zeitschrift für Psychologie und Physiologie der Sinnesorgan*), Max Wertheimer (*Psychologische Forschung*), Karl Pearson (*Biometrika*), Joseph Banks Rhine (*Journal of Parapsychology*), Jacob Moreno (*International Journal of Sociometry*), and Wilhelm Wundt (*Philosophische Studien*). At the same time, some psychologists were in their 50s, 60s, and even 70s, as in the case of B. F. Skinner's *Journal for the Experimental Analysis of Behavior*, Alexander Bain's *Mind*, Wilhelm Stekel's *Psychotherapeutische Praxis*, and E. G. Boring's *Contemporary Psychology*. And just as would be expected if Hall fell close to the central tendency, there are many examples of journals founded by those in their 30s, such as François Magendie (*Journal de Physiologie Expérimentale et Pathologie*), Moritz Lazarus (*Zeitschrift für Völkerpsychologie und Sprachwissenschaft*), and Théodule Armand Ribot (*Revue philosophique*). In fact, the *Psychological Review*, which emerged as the rival publication vehicle to Hall's *American Journal of Psychology*, was co-founded by James Mark Baldwin and James McKeen Cattell, who were 33 and 34, respectively.

Before turning to the final feature of the career acme, I must pause to observe that not all great psychologists highlight their careers by getting themselves elected president or by founding new journals.

Many of the greats seem perfectly content to restrict themselves to making intellectual contributions to psychological science.

- Ivan Pavlov, for one, confined his scientific activities almost entirely to his laboratory, and thereby avoided the distractions of professional service.
- B. F. Skinner may have founded a journal, but it was one strictly devoted to publishing research in the Skinnerian mold; he declined the opportunity to run for APA president.

Hence, a psychologist does not have to follow Hall's career emphasis to attain high status in the annals of psychology.

### *Teaching influence.*

Between the ages of 42 and 48, Hall produced three new doctorates whom would later be elected to the APA presidency, namely, Joseph Jastrow, Edmund Sanford, and William Lowe Bryan.

Thus, part of Hall's impact on psychology's history was through his students, especially those who could count themselves as Hall PhDs.

Naturally, not all great psychologists exerted so much influence through their teaching.

The German psychologist Franz Brentano, according to one historian (Michael Wertheimer, 1987), "did not have many students, but had a wide influence nevertheless" (p. 73).

Even so, given what was learned in chapter 10, Hall may be more representative of the norm than Brentano.

After all, if great psychologists are more likely to study under great psychologists, then great psychologists must teach great psychologists.

There exists evidence that excellence in research is not antithetical to excellence in teaching, as is sometimes believed.

- To begin with, because the personality traits of good teachers are orthogonal to the personality traits of good researchers, it is possible for someone to be both a prolific researcher and an effective teacher (Rushton, Murray, & Paunonen, 1983).
- As a consequence, it should not be surprising that the correlation between research productivity and teaching effectiveness is essentially zero (e.g., Voeks, 1962).
- In line with this, only half of the psychologists who earn obituaries in APA's *American Psychologist* are credited with being good teachers or mentors (Kinnier et al., 1994).

Although Hall can be considered to be someone whose teaching skills far surpassed his research prowess, his own mentor, William James, clearly attained excellence in both.

- Besides writing a best-selling textbook – the famed *Principles of Psychology* – James published a work devoted to the teaching of psychology (James, 1900).
- James even took his instructional responsibilities so seriously that he introduced student evaluations to get direct feedback on his performance.

Yet a crucial contaminating factor cannot be ignored: Just as research productivity changes across the course of the career, as shown in chapter 4, so may teaching effectiveness exhibit longitudinal trends.

- In terms of classroom performance, there is ample reason to believe that students assign lower teaching evaluations for those professors who are in the latter part of their careers (Horner, Murray, & Rushton, 1989; Kinney & Smith, 1992).

With respect to the mentoring of graduate students – informal rather than formal instruction – there may appear an age for optimal effectiveness.

- Future Nobel laureates in the sciences tend to have been trained by mentors who were in their late 30s or early 40s (Zuckerman, 1977), a figure that corresponds fairly closely to what happens in psychology as well (Gupta, Gilbert, & Pierce, 1983).

Although Hall appeared to be most effective a slightly older ages, this may be ascribed to his relatively late start.

- His three most eminent students received their PhDs when he would have been in his late 30s and early 40s, were he to have earned his own doctorate around 26 years old.
- Those students who came later in Hall's career tended to be less outstanding.
  - Henry Goddard, for instance, who got his PhD when Hall was 55 and when he himself was 33, is now considered more infamous than famous for his work on "morons" – a term he coined. Goddard's 1912 book on *The Kallikak Family* attracted special criticism, both among contemporaries and in the eyes of posterity (Gould, 1981; J. D. Smith, 1985; cf. Goddard, 1942).
  - Hall's last student, Francis Sumner, who got his PhD under Hall when the latter was 76, also cannot be said to rank with his best students. At least, Sumner did not become highly conspicuous as an original researcher (Guthrie, 1998).

One might think that as professors mature, they would acquire increasingly more disciplinary expertise, including enhanced knowledge and teaching skills.

Yet, that seems not to be the case. So what is the foundation for the apparent age-decrement in teaching influence?

- Part of the answer may come from what was discussed at length in chapter 4: Creative productivity across the career tends to follow a single-peaked age function.
- It is telling that the optimal age for creative output is located at about the same point as the optimal age for teaching impact, the late 30s and early 40s.
- Consequently, the plausible inference is that the most effective mentors are those investigators who have the most active research programs. Such mentors would provide the best models for the student's emulation.

Nevertheless, this may not be the whole story. The decline in teaching effectiveness may be part of a more pervasive age trend that slowly chips away at the great psychologist's greatness.

## *Dénouement and Epilogue*

Several distinct forces may operate to undermine the psychologists overall greatness, both as a researcher and as a teacher. The following three factors are perhaps the most noteworthy:

1. The older a scientist becomes, the less likely he or she will work hard at keeping up on the research literature. This negative trend was empirically demonstrated in a study conducted by Wayne Dennis when he was Editor of *Psychological Bulletin* (Dennis & Girden, 1954). At that time this journal was a general journal distributed to the entire APA membership. Based on 397 survey responses, he found that those in their 20s and 30s are most likely to read widely the various articles, notes, and reviews published therein. These results were then connected to research output in two ways. First, it was shown that APA Fellows read the *Bulletin* more thoroughly than other APA members. Second, the rise and fall in the reading curve tended to anticipate somewhat the rise and fall in productivity, as recorded in *Psychological Abstracts*. The latter curve was lagged about a decade behind the first. Although Dennis did not specifically address the teaching issue, any decline in reading may have consequences for the effectiveness of any instructor and mentor. Little by little, the old professor's once arduously acquired expertise becomes ever more obsolete. The failure to "keep up on the literature" is especially critical in a scientific discipline like psychology, in which knowledge becomes obsolescent at a much faster rate than in the humanities (McDowell, 1982).
2. It must be deemed ironic that a part of the decline in the research performance of scientists may be ascribed to the consequences of their very eminence. It is as if greatness self-destructs, or carries the "seeds of its own destruction," in a dialectic fashion. At least such a process is suggested in a study of 10 eminent social scientists (Rodman & Mancini, 1981). In the beginning of the career, the young researcher must run the professional gauntlet by submitting papers to rigorous, refereed journals, sometimes receiving acceptances, but often suffering rejections as well. But as social scientists attain a high degree of distinction, they begin to become the recipients of writing invitations. The 10 social scientists in the sample received an average of 21 requests a year to contribute a chapter, article, book review, or other piece. As a result, more than half of the publications that they produce at this stage in their career are due to such invitations. Furthermore, only 6% of their current writing obligations involve commitments to write journal articles. They have learned that an invitation from a journal editor to write an essay is not equivalent to guaranteed publication, for the manuscript will most often still be sent out for review, with the risk of rejection or at least a request for extensive revision. This shift in publication strategy appears to be rational, for why should luminaries expose themselves to anonymous critiques when they can publish the same thing as a book chapter? Even so, the very fact that distinguished scientists become much less accountable to the peer-review process means that they eventually can wallow in outmoded ideas with enviable immunity from collegial criticism.
3. As scientists get older, they tend to spend less time on research, and correspondingly more time on administrative tasks (Zuckerman & Merton, 1972). "Well, it is a fact of life that most professors who rise in the world have to take on administrative posts," complained one of Roe's (1965) eminent scientists when she conducted a follow-up study a dozen years after her *Making of a Scientist* (Roe, 1953a). This increased assumption of major administrative responsibilities holds for psychologists as well (Horner, Murray, & Rushton, 1994). Both teaching and research will often succumb to the time-consuming and often emotionally enervating nature of these activities. A historic illustration is James Rowland Angell whose distinguished career at the University of Chicago was not continued at Yale University, when he became the latter's president. His best doctoral students – namely J. B. Watson, H. A. Carr, June E. Downey, and W. V. Bingham – were all Chicago PhDs (M. D. Boring & E. G. Boring, 1948), and all of his best research was published prior to assuming his duties at Yale (R. I. Watson, 1974).

It is difficult to determine the extent to which the above three factors apply to G. Stanley Hall. Yet, additional factors may also be operative in Hall's case, including the developmental effect that Hall failed to discuss in his 1922 book on *Senescence*.

### *Planck's principle.*

Hall was a great admirer of the evolutionary theories of Charles Darwin, even earning the epithet “Darwin of the Mind” for his insistent incorporation of Darwinism in his psychology.

Of course, Hall’s admiration could be considered well placed.

- Darwin’s 1859 book on the *Origin of Species* has been called one of the “books that changed the world” (Downs, 1956), and was included in the collection known as the *Great Books of the Western World* (Hutchins, 1952).
- Darwin was even ranked 17th in a list of “the 100 most influential persons in history,” a spot just behind Moses (Hart, 1987).
- The impact of Darwin certainly is certainly evident in psychology’s own history. “Very likely, it is no accident that the first laboratory in psychology was functioning within 20 years of the publication of the *Origin of Species*,” claimed one history of psychology textbook (Viney & King, 1998, p. 195).

Nevertheless, it must be remembered that not all of Darwin’s contemporaries favorably judged his *Origin* to be a scientific masterpiece.

- In *Origin* Darwin (1860/1952) anticipated the book’s hostile reception with the admission that he did not “expect to convince experienced naturalists whose minds are stocked with a multitude of facts all viewed, during a long course of years, from a point of view directly opposite to mine” (p. 240).
- Yet Darwin did look “with confidence to the future, – to the young and rising naturalists, who will be able to view both sides of the question with impartiality.”
- In private, Darwin would sometimes express this view even more emphatically, as is apparent in what he once told the great geologist Charles Lyell, who was a dozen years his senior.
- “What a good thing it would be if every scientific man was to die when sixty years old, as afterwards he would be sure to oppose all new doctrines” (quoted in Hyman, 1963, pp. 375-376).
- When Lyell had finally converted to Darwinism after having reached 70, he humorously informed Darwin that “he hoped that he might be allowed to live” as a consequence of his conversion (quoted in Hyman, 1963, p. 376).

Although Darwin may have been the first scientist to speculate on this developmental possibility, the hypothesis is currently known as “Planck’s principle” (Hull, Tessner, & Diamond, 1978).

- The reason is that Planck had voiced a similar conjecture with respect to the differential response to his revolutionary quantum theory.
- In his own words, “A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it” (Planck, 1949, pp. 33-34).
- Indeed, so quick was the younger generation to embrace the quantum revolution that the emerging domain was for a time styled *Knabenphysiks* in German, that is, “kids physics.”

The eponym choice notwithstanding, the very first empirical test of the Planck principle concerned the reception of Darwin’s theory of evolution by natural selection (Hull, Tessner, & Diamond, 1978).

- In particular, the investigators asked whether age had any predictive value with respect to the odds that a British scientist would still reject Darwin’s theory a decade after the publication of *Origin*.
- Among these opponents was one major figure in the history of psychology, namely, the philosopher J. S. Mill.
- In contrast, those who accepted the Darwinian thesis early on included Francis Galton, T. H. Huxley, W. S. Jevons, and Charles Lyell.
- All told, the age of the figure at the time of *Origin*’s publication accounted for 6% of the variance in acceptance.

Although a secondary analysis of these data cast some doubt on the conclusion (Levin, Stephan, & Walker, 1995), Sulloway (1996) replicated the basic finding in a far more comprehensive empirical analysis.

- Because Sulloway incorporated more variables into his prediction equation, he was able to gauge the relative impact of the various contributing factors.
- For instance, he was able to make direct comparisons of age and birth order. “Throughout the debates over evolution, 80-year-old later borns were as open to this theory as were 25-year-old firstborns. During the Darwinian revolution, being laterborn was equivalent to a 55-year dose of the openmindedness that typically resides in youth” (Sulloway, 1996, p. 36).

Those historians who dislike the application of quantitative techniques to historical data like Sulloway’s will probably not like to hear that Planck’s principle may also apply to their very distaste.

- At least age has emerged as a predictor of whether economic historians adopt cliometric methods. About 10% of the variance is explicable in terms of age (Diamond, 1980).
- In concrete terms, a 65 year old economic historian had about one third the odds of being a cliometrician relative to a 35 year old colleague (Whaples, 1991).

What underlies the operation of Planck’s principle?

- One sociologist suggested several possibilities: “As a scientist gets older he is more likely to be restricted to innovation by his substantive and methodological preconceptions and by his other cultural accumulations; he is more likely to have high professional standing, to have specialized interests, to be a member or official of an established organization, and to be associated with a ‘school’” (Barber, 1961, p. 601; cf. Messerli, 1988; Stewart, 1986). This suggestion actually includes several causes, some psychological and others more sociological in nature.
- Especially intriguing from our perspective is the cognitive tendency for scientists to become increasingly ensnared by the ideas that they themselves created. The creativity of their early years provides the chains of their later years, in a long-term and comprehensive form of “negative transfer” or “functional fixedness.”
- Sigmund Freud admitted the influence of something like this when, at age 73, he published *Civilization and Its Discontents*. “The conceptions I have summarized here I first put forward only tentatively, but in the course of time they have won such a hold over me that I can no longer think in any other way” (Freud, 1929/1952, p. 790).
- The same pattern of life-span cognitive development may be seen in other figures besides Freud.
- Thus, “Golgi never abandoned his belief in the nervous system’s unitary nature, despite Cajal’s overwhelming evidence refuting it” (Thorne & Henley, 1997, p. 461) – and despite the irony that Golgi was obliged to share the 1906 Nobel with his scientific nemesis Ramon y Cajal.
- Likewise with respect to another Nobel laureate, a biographer once observed that Pavlov did not alter his theory of how the brain worked during conditioning in the light of more recent research; “it is as though, in 1900 or thereabouts, he stopped listening to what was going on elsewhere” (J. A. Gray, 1979, p. 102).

The previous two examples suggest that Planck's principle always functions in a negative manner, undermining rather than enhancing a psychologist's greatness.

Yet that inference is probably misleading. There are sometimes positive benefits of becoming, with increased maturity, less than fully open to new ideas.

Perhaps the most valuable asset is that a little closed-mindedness protects a scientist to resist becoming intellectually overwhelmed by some highly persuasive system of thought.

- One illustration may be found in the following quotation: "Unlike most of Freud's disciples, Jung had already established an impressive professional reputation of his own before he began his association with Freud. He was the best known of all the early converts to psychoanalysis. As a result, he was perhaps less malleable, less suggestible, than the younger analysts who joined Freud's psychoanalytic family" (Schultz & Schultz, 1992, p. 464).
- This same advantage is implicit in a statement about Hartley's relation to Hume: "Although he was a contemporary of Hume, he was probably not strongly influenced by him since Hartley began writing and publishing in a minor way on psychological matters before the appearance of Hume's *Treatise*" (Watson & Evans, 1991, p. 207).

Although more research is needed on how Planck's principle has function during the course of psychology's history, I might conjecture that its consequences for good or ill might partly depend on where individuals are positioned in their careers.

- For those who are relatively early in their careers, a little closed-mindedness would help them avoid losing their unique voice when a potent but not completely compatible perspective confronts them.
- But those who are later in their career may suffer the consequences of failing to assimilate their theories or methods to the latest advances in the discipline. They are then left behind.

In the latter part of the career, as well, Planck's principle could undermine a psychologist's effectiveness in master-disciple or teacher-student relationships. This process may be seen in the history of psychoanalysis. Josef Breuer, in his 50s when he collaborated with his younger colleague, Freud, on *Studies in Hysteria*, found himself obliged to part company with Freud as the latter began to emphasize ever more sexual etiology. By converting the latter into a dogma, Freud eventually alienated some of his best students. When Freud was 55, Adler went his separate way; when Freud was 58, Jung was compelled to do the same; under slightly different circumstances, Otto Rank split with Freud when the latter was 68 years old. After that, Freud was not to mentor students who boasted nearly the same caliber.

It is tempting to apply Planck's principle to G. Stanley Hall's mentoring career as well. Yet the application does not work very well. On the contrary, Hall seems to have maintained a very open-minded attitude toward his student's interests and aspirations till the very end of his career. This is certainly evident in his relationship with his last graduate student, Francis Sumner (Guthrie, 1998).

*Late-life effects.*

Perhaps Hall (1922) never mentioned something akin to Planck's principle because it was not something he personally experienced as a consequence of aging.

Although Hall's *Senescence* contains reports the results of questionnaire data and reviews the past literature on the subject, the work is strongly shaped by his own personal impressions, as he himself confessed.

After all, Hall knew that he had approached his final years, though he could not know that he had only two years left to live at the time the book was published.

As a consequence, Hall's work is full of observations about aging that probably reflect his own personal experiences as much or more than those of his survey respondents.

For example, according to Hall (1922),

At sixty we realize that there is but one more threshold to cross before we find ourselves in the great hall of discard where most lay their burdens down and that what remains yet to do must be done quickly. Hence this is a decade peculiarly prone to overwork. We refuse to compromise with failing powers but drive ourselves all the more because we are on the home stretch. We anticipate leaving but must leave things right and feel we can rest up afterwards. So we are prone to overdraw our account of energy and brave the danger of collapse if our overdraft is not honored. Thus some cross the conventional deadline of seventy in a state of exhaustion that nature can never entirely make good. (p. 367)

As far as Hall's own career was concerned, the above generalization may be more descriptive of the last decade of his life.

Judging from the bibliographic information provided in one reference source (R. I. Watson, 1974, p. 164), Hall's output in his 70s surpassed that in his 60s.

Especially remarkable was the quantity of major books, including *Senescence*.

Hence, Hall can be said to have ended his life and career with a final burst of creativity.

Some evidence exists that Hall's late renaissance may not be unusual.

Although the data published in Lehman's (1953a) *Age and Achievement* are often cited in support of the conclusion that creativity irrevocably declines with age, a secondary analysis revealed a higher than expected incidence of resurgence in the very last years (Haefele, 1962; also see R. A. Davis, 1954).

- For instance, the output of major philosophical works produced by thinkers between 80 and 84 exceeds the output in the preceding half-decades of 60-64, 65-69, 70-74, and, especially, 75-79 (in which the output becomes zero).
- A similar creative renaissance appeared for those who made great contributions to psychology, the output of major works during the 75-79 age interval surpassing that in both 65-69 and 70-74 – the former, in fact, exceeding the preceding two half-decades *put together!*

Thus, there is reason to believe that such a "last-chance" syndrome may highlight the lives of many great psychologists.

However, it is probably the case that this late-life effect should not be conceived in terms of a psychologist's chronological age.

Earlier in this chapter and in chapter 4 I have stressed the superior relevance of career age in describing longitudinal changes across the adult life span. Yet in the present instance, career age may be no more germane than chronological age.

Instead, the crucial developmental factor may be the perceived proximity of death – precisely as suggested in the Hall quotation given above. During the final years of life any human being undergoes a number of cognitive and physiological changes that are hard not to recognize, and certainly will not escape the notice of any observant psychologist. Presumably, it will be the onset of these developmental decrements more than a particular birthday party that will evoke the last-chance syndrome. As a consequence, the accelerated pace of creative activity that Hall discerned may take place earlier or later in the life span, depending on the status of one's intellectual and physical health.

Hence, for Wilhelm Wundt, the creative intensification occurred not in the 60s, as Hall (1922) claimed, nor in the late 70s, as Lehman's (1953a) data suggest, but in the middle 80s. This is evident in the rate at which Wundt wrote the 10 volumes of his *Folk Psychology (Völkerpsychologie)*. To quote E. G. Boring (1950),

the first volume of this work appeared in 1900 [at age 68], was later revised and finally became two volumes in a second revision. The second volume was published in 1905-1906 [age 73-74] and became two volumes on revision. Then from 1914 to 1920 [age 82-88], six more volumes appeared, making ten in all. (p. 326)

That yields an output rate of nearly a volume per year. As if finishing the last volume was not sufficient, Wundt then completed his autobiography, and died, just shortly after, in the same year. Given the quickening pace in his final years, Wundt clearly was acting like someone who was obsessively driven to get all "unfinished business" off his desk before the final hour arrived.

By the way, Peter Suedfeld and his colleagues have studied how integrative complexity changes in the final 5 years of the lives of eminent personalities (Porter & Suedfeld, 1981; Suedfeld & Piedrahita, 1984).

A conspicuous decline in the complexity of thought appears in those final years, according to their content analysis of private correspondence.

A comparable effect was found when Suedfeld (1985) later scored 85 presidential addresses delivered before the American Psychological Association.

Specifically, the more years the eminent psychologist had left to live after assuming the presidency, the higher was the level of integration and differentiation that he or she displayed in their speech.

This finding is consistent with the implicit assumption of the last-chance syndrome that psychologists undergo certain changes that allow them to "see it coming."

Of course, the fact that so many great psychologists manage to write their autobiographies in the last year or two of their lives – like Hall and Wundt did – would also imply that death's proximate arrival can often be anticipated. It usually does not make sense to write an autobiography until one can be sure that it will not have to undergo several revised editions.

The writing of autobiographies also suggests that great psychologists will often engage in a “life review” as they enter their final years (R. N. Butler, 1963). As Erik Erikson, the eminent psychoanalyst, once described the process, “those nearing the end of the life cycle find themselves struggling to accept the inalterability of the past and the unknowability of the future, to acknowledge possible mistakes and omissions, and to balance consequent despair with the sense of overall integrity that is essential to carrying on” (E. J. Erikson, J. Erikson, & Kivnick, 1986, p. 56).

This review process has been empirically investigated in a study of the autobiographies of 49 eminent psychologists (Mackavey, Malley, & Stewart, 1991).

- The autobiographical accounts were obtained from three volumes of *A History of Psychology in Autobiography* (e.g., E. G. Boring & Lindzey, 1967) and *Models of Achievement: Reflections of Eminent Women in Psychology* (O’Connell & Russo, 1983).
- These distinguished psychologists averaged around 72 years old at the time they wrote these autobiographies, and hence they were clearly approaching the final years of their lives.
- The investigators scrutinized their essays for autobiographically consequential experiences, or ACEs.
- All told, researchers identified 250 ACEs, or an average of about 5 per autobiography, with a range of 1 to 9.
- Significantly, approximately 80% of these ACEs came from the years in which the individuals were most likely in the early stages of their career development – namely between 18 and 35.
- For instance, Gordon Allport recounted a crucial incident in which he confessed to his Harvard professor, Herbert S. Langfeld, that he had misgivings about his fitness to become a psychologist. Allport received Langfeld’s reassuring response, “but you know there are many branches of psychology,” as a kind of turning point (E. G. Boring & Lindzey, 1967, p. 8). He realized that the discipline was sufficiently inclusive to leave room for someone with his maverick interests. After earning his doctorate under Langfeld, Allport felt free to pursue his own brand of psychology.

So far I have shown how the final years of great psychologists may display a last-chance burst of creativity as well as an autobiographical life review. Yet it is also conceivable that their psychological worldviews might change during these concluding years.

This is perhaps one of the weaknesses of the research reported in chapter 8. There the philosophies of psychological science were examined for 54 notable figures in the discipline’s history (Simonton, 2000b). Each figure had his or her beliefs characterized as if those beliefs were maintained throughout their entire life span.

Yet how justified are these time-collapsed characterizations? According to one history of psychology text, “there is a literary myth that Aristotle’s views were static and unchanging. We now know, however, that his thinking, like that of most creative individuals, went through various stages of development” (Watson & Evans, 1991, p. 69).

- Support for this latter assertion is readily found in the empirical literature on the content of creative products. A content analysis of the dramas of the great dramas of Aeschylus, Sophocles, Euripedes, and Aristophanes revealed that their favorite themes changed as they got older, their early interest in practical affairs gradually giving way to a preoccupation with the divine and the mystical (Simonton, 1983a).
- A similar thematic transformation has been identified in the plays of William Shakespeare (Simonton, 1986e). A fascination with worldly ambition and passionate love slowly yielded ground to a more detached view of life and its conflicts.
- Especially intriguing is research on the transformations that can take place in the creativity occurring in the concluding years of life. Thus, great painters may exhibit an “old age style” in their final years (Lindauer, 1999), while great composers may display what has been called a “swan-song phenomenon” (Simonton, 1989c). In both cases, creativity often takes a shift toward greater simplicity, profundity, and spirituality.

As yet, there has been no empirical research that specifically assesses whether analogous late-life effects might occur in the ideas expressed by great psychologists. Yet it is easy to identify possible examples in the lives of several notable figures in the field.

- The concluding years of Isaac Newton were given up to Biblical exegeses, especially with respect to the prophecies of Daniel and the Apocalypse of St. John.
- William James, in the years following the publication of *Principles*, replaced his psychological interests with increasingly more religious and philosophical preoccupations. This shift is evident in his 1902 book on the *Varieties of Religious Experience*, his various writings on Pragmatism, and his forays into psychical research.
- Although his ideas were more sympathetic and even accepting, great psychologists may instead decide to grapple with deeper intellectual and spiritual issues in a more critical, even rejecting manner. The 69-year-old Immanuel Kant, his three great Critiques already behind him, published *Religion Within the Limits of Reason Alone*, a philosophical analysis that got him into serious difficulties with the Prussian King Frederick William II.
- Sigmund Freud, an old man and slowly dying of cancer, grappled with religion and his Jewish heritage in *The Future of an Illusion* and *Moses and Monotheism*. Even Freud's growing theoretical fixation with the death instinct may be viewed as his own personal accommodation to death's inevitability.

G. Stanley Hall's life may also be taken as illustrative of these developmental trends, albeit in a more unique fashion, given that he had once aspired to enter the ministry.

- At age 73 Hall published his two-volume work on *Jesus the Christ, in the Light of Psychology*, and three years later published his *Morale: The Supreme Standard of Life and Conduct*.
- Even Hall's (1922) *Senescence*, which appeared at age 78, may be considered a continuation of this shift toward more profound and pervasive concerns than normally treated in psychology.
- This is apparent in the questions that Hall posed to his survey respondents. Hall first posed life-review issues like "Are you troubled with regrets for things done or not done by or for you?" (p. 329), "What duties do you feel that you still owe either to those about you or to the world?" (p. 333), and "Would you live your life over again?" (p. 342). Then Hall closes the questionnaire with the queries "Do you get more or less from the clergy and the church than formerly?" (p. 353) and "Do you think or worry about dying or the hereafter more or less than formerly?" (p. 354).

Hall clearly raised these issues because they were ones that he himself was contemplating as his own long life was drawing to a close. In a sense, *Senescence* was Hall's very own swan song.

## MARRIAGE AND FAMILY

Now that the great psychologist's professional career has been traced from onset and acme to decline and termination, the time has arrived to look at what happened in their private lives all the while. How did psychology's notables manage to make their personal life conform to their career ambitions? One response is that advanced by the English philosopher Francis Bacon (1597/1942):

He that hath wife and children hath given hostages to fortune; for they are impediments to great enterprises, either of virtue or mischief. Certainly the best works, and of greatest merit for the public, have proceeded from the unmarried or childless men, which, both in affection and means, have married and endowed the public. (p. 29)

Bacon's statement has received some empirical endorsement.

- Havelock Ellis (1926) concluded from his study of British geniuses that there was "a greater tendency to celibacy among persons of ability than among the ordinary population" (p. xiv). Not counting priests, the rate was nearly 1 out of 5.
- Another investigation into the lives of a more elite sample of historic figures found that 55% never married (McCurdy, 1960). Of course, the history of psychology is replete with eminent contributors who avoided taking marriage vows, such as Pascal, Hobbes, Spinoza, Locke, Leibniz, Voltaire, Hume, Kant, Schopenhauer, Kierkegaard, Spencer, Nietzsche, and Sartre. Many of these confirmed bachelors would probably have agreed with Oswald Külpe's affirmation that "science is my bride" (quoted in Ogden, 1951, p. 4).

Admittedly, some notables managed to experience some facsimile of a family life outside the institution of marriage. Even so, these instances are often "the exceptions that prove the rule."

- Descartes fathered an illegitimate child through one of his Dutch servants, but the child died young.
- Rousseau sired 5 children by a servant, but sent them all off to a foundling hospital.

To be sure, many of psychology's notables do get married and raise families. G. Stanley Hall certainly counts as an example (although he lost both his wife and one of his two children in a tragic accident). Yet a residual antagonism between family and career is suggested by the following four facts:

1. When the eminent do marry, they tend to get married at a later age than the norm, usually in their late 20s and 30s (Bowerman, 1947). The median age that influential scientists get married is 27 (Visher, 1947), and those who earn Nobel prizes are often older still, with median ages between 29 (physiology or medicine laureates) and 31 (physics and chemistry laureates; Moulin, 1951). In line with these statistics, Freud did not get married until he was 30, while James was 35, Wundt 40, Karen Horney 44, and Rousseau 56 (when he finally married the servant who bore him his abandoned children).
2. Even after marriage, the eminent will often have relatively few children, if any.
  - a. Francis Galton (1874) was the first to note this fact, which he reported in his *English Men of Science*. He observed that the eminent scientists in his survey all had families that were smaller than those of their parents. Galton himself took this tendency to the extreme: Despite coming from a very large family, he and his wife were childless.
  - b. This general trend is also apparent in the 64 eminent scientists in Roe's (1952) study. For instance, the 14 psychologists in her sample averaged only 1.6 children, with a range of 0 to 4.
  - c. Naturally, there always exist exceptions to any statistical regularity, such as Berkeley and Freud, who both had 6 children. But on the whole, procreative fertility is not linked with creative productivity.
3. Neither the marriages nor the general family life may come anywhere close to approaching the ideal. Whether you are a spouse or a child, it is not always easy to live with someone who works as hard as the typical eminent psychologist.
  - a. Some of the consequent domestic conflicts and dissatisfaction may be revealed in an investigation into those who were sufficiently distinguished to earn obituaries in *American Psychologist* (Kinnier et al., 1994). Even though at least 72% had been married one or more times, and at least 51% had one or more children, only 35% were viewed as a valued family member. Given the eulogistic nature of obituaries, moreover, one must wonder whether the latter percentage may be somewhat exaggerated.
  - b. Incidentally, there is some reason to believe that psychologists may differ from other scientists in terms of the stability of their relationships. Although one study of eminent scientists reported that 83% of those married enjoyed stable marriages (Post, 1994), and Roe (1953a) found comparable figures for her physical and biological scientists, she also noted that the social scientists in her sample had much less stable marriages than did the others. Specifically, 41% of the social scientists had divorced, in comparison to 15% of the biologists and 5% of the physical scientists.
4. Married scientists, even if male, may pay a price for taking on the increased responsibilities and cares of marriage and family. One recent study compared the creative output of 252 eminent male scientists, 70 unmarried and 182 married (Kanazawa, 2000). All were of sufficient distinction to earn entries in a standard biographical dictionary of notable scientists (Gillispie, 1970-1980). The bachelors were just as likely to make the greatest contributions in their late 50s as in their late 20s, suggesting a minimal decline in output. In contrast, the married scientists were far less likely to make a major discovery or invention in the later of the two life periods. This contrast also shows up in the typical ages at which scientists produce their best work. About a six-year difference separates the peak age for the married and unmarried scientists, with the latter displaying the later peak. In concrete terms, whereas the married luminaries tended to peak around 34 years of age, the unmarried notables peaked around 40. Empirical research needs to determine whether this differential applies to comparably eminent psychologists.

Before leaving this subject, I would like to broach a subject about which there has been virtually no empirical research: the sexual orientation of great psychologists.

Homosexuals and bisexuals are practically absent among eminent scientists, unlike the relatively high percentages seen among distinguished writers and artists (Goertzel, Goertzel, & Goertzel, 1978; Ludwig, 1995; Post, 1994).

The same appears to hold for psychology as well. At least, the number of confirmed cases of gays or lesbians is very small, in both absolute and relative terms.

- One of the few secure cases is Roger Brown, the distinguished US social psychologist and psycholinguist. Brown made his sexual orientation quite public when he titled his 1996 autobiography *Against My Better Judgment: An Intimate Memoir of an Eminent Gay Psychologist*.
- Other instances probably exist, but they are more speculative than factually verifiable.
- One very probable case is Harry Stack Sullivan, who adopted a 15-year old male who eventually became Sullivan's life-long partner.
- Anna Freud's relationship with Dorothy Burlingham, with whom she lived and collaborated, is often viewed as another example, without any proof one way or the other.

Needless to say, fear of social stigma, job discrimination, or legal castigation has probably encourages many notables to keep their sexual orientation a deeply guarded secret.

The consequences of failing to do so are demonstrated in the life of mathematician Alan Turing, the originator of the "Turing Test" in artificial intelligence. Besides having to undergo hormone therapy to avoid imprisonment, Turing eventually lost his security clearance for top-secret government work. These experiences may have driven Turing to commit suicide. He was just two weeks shy of his 42nd birthday.

## LIFE'S TERMINATION

Alan Turing's fate also reminds us all that we are ultimately mortal, no matter how we actually end our days.

Some notables in psychology's history, like Turing, died young, even without taking their own lives.

Blaise Pascal, another progenitor of artificial intelligence research, was only 39 years old.

Others, in contrast, live to ripe old ages.

G. Stanley Hall lived to 80, but this barely octogenarian status is surpassed by Johann Wolfgang von Goethe and Sigmund Freud (both to 83), Voltaire and Jean Piaget (both 84), Gustave Theodor Fechner, Carl Jung, and B. F. Skinner (all 86), Ivan Pavlov and Anna Freud (both 87), Wilhelm Wundt (88), and R. B. Cattell (93); all life spans calculated from birth year to birth year rather from birthday to birthday).

This extreme variation in life span leads to the final question to be considered in this chapter: What is the life expectancy of great psychologists? How does the expected life span differ from what is normal in other achievement domains?

Let us first establish the baselines for comparison.

- Most of the British geniuses studied by Havelock Ellis (1926) died in their late 60s or early 70s.
- Likewise, a study of eminent Americans obtained a mean of 69 (Bowerman, 1947) while another of eminent Japanese got a mean of 66 (Simonton, 1997a), a figure virtually identical to the average life span of Cox's (1926) geniuses.
- Cox also showed that only 11% lived less than 50 years, whereas nearly 15% lived to be 80 or more.

However, the research also shows that life expectancy is contingent on several factors.

In the first place, the predicted life span of an eminent individual varies according to the field of achievement.

- Ellis (1926) first pointed out that poets tend to die younger than other eminent figures, an abbreviated life that apparently holds for all of the world's major literary traditions (Simonton, 1975a; but see Simonton, 1997a).
- A somewhat later investigation showed that eminent scientists tend to live longer than eminent writers, by pretty substantial difference, namely 69 versus 63 years (Raskin, 1936; also see Cassandro, 1998).
- This same contrast was found in a much more recent study, which found a life expectancy of about 72 for scientists and intellectuals, but only 65 for writers and 61 for composers (Post, 1994; also see Cassandro, 1998; Kaun, 1991).
- Lehman (1943) reported a similar disparity between scientists, mathematicians, and inventors, on the one hand, and oil painters, on the other, with a difference of nearly 6 years.
- In Cox's (1926) data, the philosophers and scientists (both around 68) were exceeded only by the statesmen (70), whereas her writers, artists, musicians, religious leaders, soldiers, and revolutionaries all died younger (the latter having a life expectancy of only 51 years).
- Yet even within specific scientific disciplines the predicted life span may vary systematically (Simonton, 1991a). Most striking is the tendency for great mathematicians to die younger than most other scientists.
- Where the life expectancies in various scientific disciplines tend to range between 69 and 72 (also see Visher, 1947), the expected life span for mathematicians is around 63.

Turing and Pascal are not that unusual after all. In fact, several of the key figures in the emergence of computer science – the mathematical domain most strongly allied to psychology – suffered from shortened life spans. George Boole, of Boolean algebra fame, died at age 49, while John von Neumann, who developed both game theory and the computer model of the brain, died at age 54.

But why should life expectancies vary according to domain of achievement?

One possible reason must be discussed at once, namely, that these interdisciplinary contrasts are merely methodological artifacts.

In particular, unless controls are introduced to ensure that the representatives of different domains were all born at the same time.

Any heterogeneity in the average birth years across different samples will confound inter-domain differences, if any, with any secular trends toward increased life expectancy.

- Admittedly, the temporal increase in life span for famous personalities should not be nearly as great as for the population at large (because the figures for the former necessarily exclude those who die prior to maturity), upward trends have still be identified for eminent individuals (e.g., Simonton, 1977b).
- For instance, the average life span of illustrious scientists has increased from 61 years in the 16th century to 72 years in the 20th, an increment of more than a decade (Zhao & Jiang, 1986).

Even so, empirical studies have established consistent differences in life span across different domains of achievement even after introducing statistical controls for year of birth (Simonton, 1991a, 1997a).

Another possibility has to do with the empirical research on the relation between age and achievement. As discussed at length in chapter 4, there exist substantial domain contrasts in career trajectories, including the expected location of the first, best, and last contribution.

These differences cannot help but leave some impact on life expectancy.

- For some fields, such as mathematics, it is possible to start making lasting contributions at a relatively early age, whereas in other fields, such as the earth sciences, it usually requires considerably more maturity before an individual can begin to have an influence on the field.
- This implies that individuals can die sooner and still leave an impression in those fields that have early career onsets and perhaps early career peaks.

On the whole, this appears to be the case.

- Poets tend to peak earlier than other prose writers, and to have shorter life expectancies besides (Simonton, 1975a).
- The same happens in the case of mathematics relative to other disciplines (Simonton, 1991a).
- A similar pattern holds in leadership domains, such as revolutionaries versus status-quo politicians or the founders of major religious faiths versus the leaders of established religions.
- On the other hand, one reason why great philosophers tend to have longer life expectancies than creators in other fields is that the career trajectory for writing philosophy tends to be shifted toward the more mature years of life.

Lending additional support to the foregoing explanation of inter-domain contrasts in life expectancy is the empirical finding that at the individual level, those who begin their careers earlier than average also tend to have shorter predicted life spans (Simonton, 1977b; Zhao & Jiang, 1986).

- For instance, in one large sample of eminent scientists, those who began making contributions at an unusually young age tended to live about 10 fewer years than those who launched their careers at more average years (Zhao & Jiang, 1986).

The domain of achievement is by no means the exclusive determinant of life span.

- Certainly, the life expectancy of historical figures, like everybody else, must be affected by severe alcoholism (Lester, 1991), chronic stress (Barry, 1969, 1983-1984; Simonton, 1997a), and violent death, including suicide (Lester, 1991; Simonton, 1997a).

Besides Turing, the German physiologist Johannes Müller, the German physiologist, probably died a suicide at age 57.

Of course, there also exist exceptions, such as the American psychologist Hobart Orval Mowrer, who killed himself at age 75, and the American physicist Percy Bridgman, the founder of operationalism, who took his own life at age 79. Suicide need not seriously abbreviate a suicide's life span.

Furthermore, life span is associated with other variables that are more unique to creative genius. One such factor is versatility. As observed in chapter 6, some eminent figures are monomaniacs, focusing all their efforts on a single domain, whereas others decide to contribute to a variety of domains.

- A recent study of 2,102 famous personalities revealed that highly versatile scientists – especially those who make contributions outside the sciences proper – tended to have shorter life spans than the nonversatile ones (Cassandro, 1998).

Another correlate of life expectancy is even more intriguing, for it gets at the very heart of greatness, namely, eminence. One might think that a longer life span would be more conducive to the attainment of distinction than that would be a shorter one. This prediction follows from the fact that lifetime output is positively correlated with ultimate eminence, given that an abbreviated life would seem to mandate a truncated career.

- In line with this argument, there is some evidence that the more eminent enjoy greater longevity in both scientific and literary domains (Raskin, 1936).
- However, a little more thought reveals that the phenomenon may be more complex than indicated by this single consideration. As noted before, if precocious creators have shorter life spans, then an early death will lessen their total output much less, given their early start in the first place. Moreover, there might be a “sympathy” or “tragedy” factor that could exaggerate a creator's renown if he or she dies at an unusually young age, such as happened to Pascal.
- In fact, if the eminence of the creators in Cox's (1926) sample is plotted against life span, a nonmonotonic U-shaped curve results (Simonton, 1976a). The least famous are those who died around their 60th year, whereas the most famous are those who died either younger or older than that age.
- Lehman (1943) observed that a similar curve has been identified for the amount of lines devoted to 1,036 deceased physicians in obituaries published in the *Journal of the American Medical Association* (cf. Mills, 1942).

Hence, the sympathy or tragedy effect may be very real. Yet because none of these studies concentrated on psychologists, it is impossible to say with confidence that this effect might account for a portion of the reputation of the Russian psychologist Lev Vygotsky, who died at age 38, a longevity inferior even to Pascal's.

Indeed, very few studies have focused specifically on the lives of great psychologists.

- A study of 69 eminent American psychologists did obtain a mean life span of 71 years, with a range from 43 to 94 (Simonton, 1992b). However, there was a sampling bias in the data that renders this figure suspect. In particular, to make it into a sample, the psychologist had to be deceased, which meant that the more recently born subjects had to die younger in order to be sampled! Accordingly, the correlation between life span and birth year was  $-.62$ , a highly unlikely statistic (also see Zusne, 1976).
- Another investigation used a different sampling criterion, and obtained a higher mean (Kinnier et al., 1994). Specifically, individuals of sufficient importance to receive obituaries in *American Psychologist* had reached a median age of 76 at time of death, and fully 58% had lived to become either septuagenarians or octogenarians.

Hence, the life spans attained by G. Stanley Hall, Sigmund Freud, Jean Piaget, Ivan Pavlov, and other notables are by no means exceptional. In this respect, great psychologists fall right in the same league as great philosophers and great scientists. The emphasis on a life of the mind – in both senses of the word – is evidently good for the health.