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# The Nature of Creativity in Old Age

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## Abstract

A number of psychologists have concluded that creativity is primarily the domain of the young. Recent research has shown that this is wrong. *Conceptual* innovators make sudden radical innovative leaps, early in their careers. But *experimental* innovators work incrementally to develop new methods based on extended observation, and their innovations emerge late in their careers. The psychologists who contended that creativity diminishes with age failed to perceive that virtually every intellectual activity has had important older experimental innovators as well as their young conceptual rivals. Their error poses a barrier to understanding creativity, and makes a damaging contribution to ageism. This paper briefly examines the achievements of a number of great experimental innovators, including Charles Darwin, Charles Dickens, Paul Cézanne, and Elizabeth Bishop, and uses their work as the basis for an understanding of the specific mechanisms that connect age with experimental creativity.

## Creativity and Age

Does creativity diminish or disappear as we age? Some psychologists have believed that it does. In 1953, Harvey Lehman (pp. 330-31) concluded that “Superior creativity rises relatively rapidly to a maximum which occurs usually in the thirties and then falls off.” He described what he called a gerontic paradox, that “the old possess greater wisdom and erudition...But when a situation requires a new way of looking at things, the acquisition of new techniques or even new vocabularies, the old seem stereotyped and rigid.” Colin Martindale (1989, p. 221) agreed that “In general, a person’s most creative work is done at a fairly early age,” and Dean Simonton (1990, p. 326) concurred that “creativity seems to peak in early to middle adulthood.”

These conclusions might seem odd when we think of some creative landmarks of the modern era. Darwin published *The Origin of Species* at the age of 50. Tolstoy published *Anna Karenina* at 49, Dostoevsky *The Brothers Karamazov* at 59, Twain *Adventures of Huckleberry Finn* at 50, Proust the final volume of *In Search of Times Lost* at 56, and Woolf *To the Lighthouse* at 45. Rodin completed the *Monument to Balzac* at 49. Robert Frost published “Stopping By Woods on a Snowy Evening” at 48, and Elizabeth Bishop “One Art” at 65. Frank Lloyd Wright completed the New York Guggenheim at 76, Le Corbusier Notre Dame du Haut at Ronchamp at 63, and Frank Gehry the Guggenheim Bilbao at 64. Alfred Hitchcock directed *Vertigo* at 59, and *Psycho* at 61; Clint Eastwood directed *Unforgiven* at 62, and *Million Dollar Baby* at 74. Irving Berlin wrote “God Bless America” at 51, and “White Christmas” at 54.

Perhaps these are mere anomalies, isolated examples of creativity at older ages? Quantitative evidence says otherwise. A recent study of nearly 3,000 physicists found that a scientist’s most highly cited publication had an equal probability of being published at any point

within the sequence of papers the scientist published (Sinatra, Wang, Deville, Song, and Barabasi, 2016).

### Conceptual and Experimental Innovators

The psychologists quoted above were wrong. Creativity is not the prerogative of the young, but can occur at any stage in the life cycle. What the psychologists failed to recognize is that there is not a single kind of creativity, but that in virtually every intellectual discipline there are two different types of creativity, each associated with a distinct pattern of discovery over the life cycle. The bold leaps of fearless and iconoclastic young *conceptual* innovators are one important form of creativity. Archetypal conceptual innovators include Einstein, Picasso, Eliot, Hemingway, Warhol, Godard, Plath, and Dylan. But there is another, very different type of creativity, in which important new discoveries emerge gradually and incrementally from the extended explorations of older *experimental* innovators. Darwin, Tolstoy, and the other late bloomers listed in the second paragraph of this article were all important innovators of this kind.

The differing life cycles of conceptual and experimental innovators reflect fundamental differences in both the nature of their creativity and the means by which they achieve it. Conceptual innovations express ideas or emotions. Conceptual innovators determine the purpose of a work before they begin executing it, so they typically plan their works carefully before executing them systematically. The clarity of their intent can allow them to feel that they have fully realized their objectives for a particular work. Conceptual innovations often appear suddenly, as a new idea can yield a novel work that fully expresses the idea.

In contrast, experimental innovators are concerned above all with perception. They work inductively to develop new methods based on extended observation and experimentation. They privilege process over products, and hope to make discoveries in the course of working. Their

vague goals leave them feeling perennially dissatisfied with their work, but uncertain how to improve it. Their uncertainty leads them to proceed tentatively and incrementally, by trial and error. Experimental innovations consequently emerge gradually, over an extended period; they are rarely embodied in a single work, but appear piecemeal in a body of related works.

Conceptual innovations are surprising combinations of elements that had previously been unrelated. The most radical conceptual innovations combine elements that had previously existed in different domains, and the ability to connect these requires imagination and intellectual freedom. This is why radical conceptual innovation is typically the prerogative of recent entrants into a discipline, who have not had time to become constrained in their thinking by growing accustomed to following the domain's established conventions and practices. Because most new entrants into intellectual disciplines are young, important conceptual innovations are usually made at early ages.

Experimental innovators want their products to emerge from sustained direct observation of reality. Their late innovations are generally their most powerful because they are based on greater accumulated knowledge, and formulated with greater technical mastery developed over long periods of study. The experimental innovations of cautious old masters often arrive gradually and unobtrusively, and may be long overlooked and undervalued. Recognizing that important innovations need not be blatant, but can be subtle and inconspicuous, can help us correct the error of the longstanding scholarly belief that creativity is greatest in youth (Galenson 2018). It is consequently worth pointing out the specific mechanisms that connect age with experimental creativity. This can be done by considering the examples of some important experimental innovators.

Cézanne

The single year from with Paul Cézanne's work is most frequently illustrated in textbooks of art history is 1906 – the last year of his life, when he was 67. Two years earlier, in a letter to a younger friend, Cézanne (1995, pp. 299, 302, 315) assessed his own achievement:

In your letter you speak of my realization in art. I believe that I attain it more every day, although a bit laboriously. Because, if the strong feeling for nature – and certainly I have that vividly – is the necessary basis for all artistic conception on which rests the grandeur and beauty of all future work, the knowledge of the means of expressing our emotion is no less essential, and is only to be acquired through very long experience.

A few months later, Cézanne wrote to the painter Emile Bernard that “I progress very slowly, for nature reveals itself to me in very complex ways; and the progress needed is endless.” The next year, Cézanne again told Bernard that he believed he had made some progress, “rather slow,” in his latest works, then added, “It is, however, very painful to have to state that the improvement produced in the comprehension of nature from the point of view of the picture and the development of the means of expression is accompanied by old age and a weakening of the body.” These letters expressed Cézanne's conviction that above all two elements – the acuity of his perception of the subject, and the development of a technique that would allow him to express that perception – were critical to the improvement of his art, and his belief that both of these elements could only be the products of long and painstaking study. These letters also expressed his cautious judgement that he was making progress. Scholars have agreed, as Roger Fry (1984, p. 41) wrote of his “long research of an ultimate synthesis which unveils itself little by little from the contemplation of the things seen,” and Meyer Schapiro (1952, p. 27) declared that “the years from 1890 to his death in 1906 are a period of magnificent growth.”

Twain

Mark Twain emphasized that his fiction always grew out of things he knew directly – “life with which I am familiar” – so it is not surprising that he considered experience “an author’s most valuable asset.” For Twain, experience was what brought fiction to life, and it could only be the product of deep knowledge of the subject: “Almost the whole capital of the novelist is the slow accumulation of unconscious observation.” This took time: “The life, the soul, the genius of a people are realized only through years of absorption.” In addition to the experience of life, the writer needed experience of his craft, which also required time: “Every man must *learn* his trade – not pick it up. God requires that he learn it by slow and painful processes. The apprentice hand in blacksmithing, in medicine, in literature, in everything, is a thing that can’t be hidden.” (Dawidziak, 1996, pp. 15, 47-55). T.S. Eliot recalled that reading *Tom Sawyer* – “a boys’ book, and a very good one” – had not prepared him for *Huck Finn*, “the only one of Mark Twain’s various books which can be called a masterpiece.” He contended that Twain’s growth in the eight years between the two books was not only in his skill in the use of language, but in his creation of the form of the narrative: “We look at Tom as the smiling adult does: Huck we do not look at – we see the world through his eyes. The two boys are not merely different types; they were brought into existence by different processes.” This created a basic difference in the depth of characterization: “Huck’s persisting admiration for Tom only exhibits more clearly to our eyes the unique qualities of the former and the commonplaceness of the latter.” Twain’s mature mastery of language allowed him to create Huck consistently and convincingly: “there is no exaggeration of grammar or spelling or speech, there is no sentence or phrase to destroy the illusion that these are Huck’s own words.” Twain created Huck experimentally, for “*Huckleberry Finn* is not the kind of story in which the author knows, from the beginning, what is going to happen.” Twain’s experience, both of writing and of life growing up on the Mississippi, allowed him to give a

simple boy a quality that made him one of fiction's greatest characters: "Huck has not imagination, in the sense in which Tom has it: he has, instead, vision. He sees the real world; and he does not judge it – he allows it to judge itself" (Bloom, 2006, pp. 33-41).

### Darwin

Charles Darwin's career was based on the conviction that theories should be the product of deep and detailed knowledge. At the age of 22, he accompanied a Cambridge geology professor on a trip to Wales. Darwin (2005, pp. 59, 132) was "utterly astonished" when the professor dismissed a single anomalous discovery as uninteresting, because of the lack of related evidence that the oddity was of real significance. The lesson was lasting: "Nothing before had ever made me realize...that science consists in grouping facts so that general laws or conclusions may be drawn from them." At 62, Darwin gave a concise statement of his formula for creativity, in a letter congratulating his youngest son on passing a college exam. The boy was not a distinguished student, and Darwin's own mediocre record as a student clearly allowed him to identify with Horace. His encouragement to his son stressed that creativity did not depend solely on intelligence:

I have been speculating last night what makes a man a discoverer of undiscovered things, and a most perplexing problem it is. Many men who are very clever – much cleverer than discoverers – never originate anything. As far as I can conjecture, the art consists in habitually searching for causes or meaning of everything that occurs. This implies sharp observation and requires as much knowledge as possible of the subject investigated.

Steve Jones (2011, pp. x-xi) recently emphasized the vast amount of evidence Darwin produced, and its far-reaching impact:

His lifelong labors – six million words in nineteen published works, hundreds of scientific papers, and fourteen thousand letters – generated an archipelago of information, a set of connected observations that together form a harmonious whole. Biology emerged from that gargantuan effort as a unitary subject, linked by

the great idea of common ancestry, of evolution. The volumes written in Down House made sense of a whole new science and enabled its students to navigate what had been an uncharted labyrinth of shoals, reefs and remote islets of apparently unrelated facts.

Jones believed that Darwin “became a better scientist as he grew older for he began to test ideas with experiments, many far ahead of their time, rather than collating the results of others.”

Antonello La Vergata observed that Darwin’s intellectual ability itself developed over time:

“Darwin students today generally agree that Darwin’s theory was constructed, not discovered, and that it was the result of the evolution of a creative system: Darwin’s mind” (Kohn, 1985, p. 934).

### Shakespeare

Harold Bloom (2002, p. 18) contended that the uniqueness of Shakespeare’s genius was in peopling a world with “men, women, and children preternaturally natural. Cervantes rivals him with two giant personalities, Don Quixote and Sancho Panza, but Shakespeare has hundreds.”

Shakespeare was an experimental innovator; Stephen Greenblatt (2009, p. 299) observed that his achievement was “not a sudden, definitive innovation, but the subtle refinement of a particular set of representational techniques.” T.S. Eliot considered Shakespeare the greatest of poets and dramatists, and never stopped pondering the nature of his development, which served as a focal point for Eliot’s consideration of the relationship between age and creativity. Eliot marveled at the “slow, continuous development of mastery of his craft of verse,” that never ceased: “To the last Shakespeare is inexhaustible. Whatever he did was new” (Kermode, 1975, p. 250; Ricks, 1996, p. 392). Eliot contrasted Shakespeare’s creative life cycle with that of a transgressive young genius who was his exact contemporary:

We can also observe...that the plays of Christopher Marlowe exhibit a greater maturity of mind and of style, than the plays which Shakespeare wrote at the same age: it is interesting to speculate whether, if Marlowe had lived as long as Shakespeare, his development would have continued at the same pace. I doubt it:

for we observe some minds maturing earlier than others, and we observe that those which mature very early do not always develop very far.

Eliot thus recognized the difference between the life cycles of conceptual and experimental poets. Reflecting on the quality of maturity, Eliot remarked that Shakespeare's greatness not only grew as the writer aged, but became more apparent to the reader as he himself aged: "No reader of Shakespeare ... can fail to recognize, increasingly as he himself grows up, the gradual ripening of Shakespeare's mind" (Kermode, 1975, p. 117). In his last public lecture, at 73, Eliot (1965, p. 23) remarked that "So great is Shakespeare...that a lifetime is hardly enough for growing up to appreciate him," and in one of his last essays he declared that "of Shakespeare, the development of one's opinions may be the measure of one's development in wisdom." The extended and gradual development of the experimental Shakespeare was alien to the conceptual Eliot, who considered it no less than miraculous that a poet "should find something new to say, and say it equally well, in middle age." The conceptual Eliot's own creative life cycle had followed a very different path, and the subject must have been an uncomfortable one in view of Eliot's awareness of the loss of his own early creativity. But Eliot was too perceptive a reader not to recognize the growth of Shakespeare's art over the course of his life, and too principled a critic not to ponder the ways in which his creativity grew with age.

### Dickens

The greatness of Charles Dickens' experimental art was a product of perception: the novelist Angus Wilson noted that "he had a marvelous ear; but, I believe, an only just less marvelous eye" (Ford and Lane, 1961, p. 379). Dickens' genius lay in making readers see and hear his people. Thus T.S. Eliot compared his creation of characters to Shakespeare, "in that a single phrase, either by them or about them, may be enough to set them wholly before us" (Ford and Lane, 1961, p. 152). Wilson reflected that he was haunted "by scenes and characters from

Dickens' novels," but that this "obsessive power" of the novels "does not derive from their total statements; it seems to come impressionistically from atmosphere and scene which are always determinedly fragmentary" (Ford and Lane, 1961, pp. 375-76).

Dickens' greatest weakness was his plots. G.K. Chesterton facetiously contended that *The Pickwick Papers* was not a novel, for all novels must have an end, and *Pickwick* lacked one: "The point at which...we find the printed matter terminates is not an end in any artistic sense of the word. Even as a boy I believed that there were some more pages that were torn out of my copy, and I am looking for them still" (Ford and Lane, 1961, p. 109). Dickens suffered from the experimental affliction that as his characters developed, they would not obey his plans for them: his eldest son reported that he had "often and often, heard him complain that he could *not* get the people of his imagination to do what he wanted, and that they would insist on working out their histories in *their* way and not *his*" (Collins, 1981, p. 120). And so Dickens' friend Edward Bulwer described Dickens "groping his way" through his manuscripts, working out the meanings of his novels as he wrote them (Douglas-Fairhurst, 2011, p. 199). Dickens' flexibility in plotting was such that he actually changed the ending of one of his greatest novels in response to a criticism by Bulwer. Thus Dickens wrote to John Forster that "You will be surprised to hear that I have changed the end of *Great Expectations*...Bulwer so strongly urged it on me, after reading the proofs, and supported his view with such good reasons, that I resolved to make the change" (Forster, 1969, p. 289). Dickens published the revised ending in 1861, but ever since Forster revealed the original ending in 1874, generations of critics and scholars have debated the relative merits of the two versions. One of these scholars recently observed that revising the conclusion may have seemed "palatable" to Dickens because he had already significantly altered the first ending before Bulwer objected to it (Bloom, 2000, p. 177).

Among Dickens' great late achievements were *Great Expectations*, which he published at 49, and *Our Mutual Friend*, at 53. His art had developed in a number of ways over time. He improved his organization and plotting. Daniel Burt observed that "There is perhaps no better illustration of the remarkable development of Dickens as a novelist than by a comparison between the exuberant, picaresque improvisation of *The Pickwick Papers* [published at 25] and the taut control of *Great Expectations*" (Burt, 2004, p. 71). Dickens also refined his mastery of characterization. A key element of Dickens' success in creating vivid characters lay in his ability to give his fictional people individualized habits of speech, or idiolects. Robert Golding's linguistic analysis demonstrated that Dickens' use of this device grew more effective over the course of his career, as "the artistry revealed in their development and utilization makes decisively clear the author's gradual progress towards a bettering of his fictional art." Whereas in his early novels only a few characters had distinct personal idiolects, "in the works of the final period it was no longer... a group of leading figures with very pronounced idiolects being supported by a cast of typified 'also-rans,' but one of a world in which each separate character is the possessor of a sharply delineated speech idiom which cannot be ignored." The richness of the later novels was a product of a gradual and progressive "stylistic transformation which took in Dickens' fictional writing as a whole, one which finally succeeded in merging all the elements involved – including the idiolects – into a finely balanced whole." (Golding, 1985, pp. 213, 219, 228).

### Bishop

Late in his life David Kalstone (1989, pp. x-xi) set out to write a book about the generation of American poets who came of age after World War II, but as he worked, Elizabeth Bishop "eventually took over my book." The manuscript he left unfinished when he died was

about “the steady growth of an extraordinary mind.” The poet Thom Gunn (1993, pp. 78-79) recalled that when he first met Bishop, he felt that there was a depth in her personally that had not gotten into her poetry, but when he read *Geography III*, the last of her books published in her lifetime, “all at once everything was changed...It was only ten poems long, and yet its achievement was such that it retrospectively altered the emphasis and shape of an entire career.” Thomas Travisano (1988, pp. 154-205) pointed to specific ways in which Bishop’s work developed over time. Her idiomatic language and conversational voice grew more relaxed. Her understated treatment of details of everyday life grew subtler. The timing of her poems increasingly allowed images to emerge gradually, as if the poem were being composed as the reader examined it. The tone of her writing became increasingly elegiac, so that even her most personal poems were not confessional in the standard sense: her meditations dealt with not only personal loss, but with the universality of loss. She treated humble and overlooked subjects, finding “[a]mongst the discarded and ignored...examples of integrity, dignity, courage, humor, and grace.” These qualities made Bishop’s late poetry an inspiration to Gunn and other young poets who wanted to make their art from careful observation of life. Bishop had a profoundly experimental distrust of theorizing about poetry. But late in her life, in a letter to a literary scholar she came close to a generalization about why art might grow with the accumulation of knowledge and experience: “Well, it takes an infinite number of things coming together, forgotten, or almost forgotten, books, last night’s dream, experiences past and present – to make a poem” (Bishop, 1994, p. 621).

### Aging Gracelessly

In contrast to the examples of great experimental innovators considered above, old age has rarely been a time for major discoveries by conceptual innovators. A central problem is that the

accumulation of experience in a discipline is the enemy of the radical departures from existing approaches that constitute conceptual creativity. The ability to perceive these typically diminishes in proportion to the time an artist or scholar spends considering a particular problem, because this time creates habits of thought that constrain the formulation of novel ideas.

It might be thought that conceptual young geniuses would be well advised to change their ways as they grow older, in order to change into experimental old masters. But historical evidence, which reveals very few cases in which innovators have made important contributions both conceptually and experimentally, suggests that this transformation is more easily said than done. Edouard Manet was one of these rare exceptions. Thus he made his famous *Olympia* by a conceptual process at the age of 31, then made his no less celebrated *Bar at the Folies-Bergère* 19 years later, by an experimental process that involved radical changes in the course of executing the painting (Galenson, 2006, pp. 51, 57). Manet's strong friendship with Claude Monet and the other members of the experimental Impressionist group may have been responsible for his evolution away from the careful preconception of his early masterpiece to the improvisation of his late one. But the rarity of his achievement points to the great difficulty of changing not only a way of working, but of thinking, from the clarity of a deductive conceptual approach to the uncertainty of an inductive experimental one.

A different path for aging conceptual innovators would be deliberately to make a novel conceptual departure in old age, completely different from their earlier contributions. The difficulty of doing this successfully is again suggested by how rarely this has occurred in the past. Two successful cases can be cited here, that coincidentally both took place at the age of 56. Thus Pablo Picasso, who had startled the art world with his *Demoiselles d'Avignon* at 26, produced *Guernica* 30 years later, and Gerhard Richter, who had pioneered European Pop art in his 30s,

two decades later produced a series of 15 paintings from photographs of three deceased members of the Baader-Meinhof terrorist group. Picasso was outraged by the obliteration of a Basque town by German bombers acting for the Spanish fascists, just as Richter was by the deaths of the terrorists in a German prison (Galenson, 2009. pp. 139-40). The two artists' reactions to these shocking events was so strong that it jarred them out of their normal habits in the selection of subject matter, and this resulted in novel and important contributions.

Significant cases of conceptual creativity in old age are rare. Few aging conceptual innovators have had younger experimental colleagues as great as the Impressionists, and few conceptual artists have been able to make constructive responses to external events that shocked them. The loss of creativity was true even of as towering an innovator as Albert Einstein, who produced one of the greatest of all scientific breakthroughs at the age of 36, then spent the remainder of his life refusing to accept the next intellectual revolution created by younger physicists. Among the many scholars who have pondered Einstein's stubborn refusal to accept quantum mechanics, his friend and biographer Abraham Pais (2005, pp. 463-64) speculated that "making great discoveries can be accompanied by trauma, and...the purity of Einstein's relativity theories had a blinding effect on him."

### Creativity in Old Age

The psychologists quoted at the outset of this article assumed that the accumulation of knowledge and experience serves only to reduce the flexibility, and consequently the creativity, of the old. Greater knowledge, and associated entrenched habits of thought, do appear to constrain conceptual innovation, for they create barriers to the extreme simplifications that often characterize conceptual creativity, and they tend to erode the brash self-confidence of the

cocksure young prodigy who can make bold leaps into the unknown because he is not yet aware of, and intimidated by, the complexity of his discipline.

But the recipe for experimental innovation is very different. Great experimental innovators develop not only vast stores of knowledge – “as much knowledge as possible of the subject investigated,” in Darwin’s words – but also the technical means by which to turn it into a novel contribution – Cézanne’s “knowledge of the means of expressing.” Both the accumulation of great knowledge and the construction of new technical means are “only to be acquired through very long experience,” in Cézanne’s words, and this implies that their greatest results will almost always appear late in a career. In the presence of appropriate technical expertise, greater knowledge affords the experimental innovator a larger and more trustworthy foundation for generalizations, to support ever broader and more far-reaching conclusions. A key contributing factor is that many great experimental innovators, like Cézanne, Darwin, Shakespeare, and Bishop, are “inexhaustible,” never lose their fascination with their chosen discipline, and consequently never cease developing intellectually.

In dismissing increasing age as a source of creativity, Lehman and the scholars who followed him in this error were guilty of mistaking a part of creativity for the whole. Old age and great experience may be lethal to the creativity of conceptual young geniuses, but they are the lifeblood of the innovations of experimental old masters. This analysis would come as no surprise to Paul Cézanne, Charles Darwin, Mark Twain, Elizabeth Bishop, or any other great experimental innovator. Among the latter was Louise Bourgeois (1998, pp. 318-19), a great experimental sculptor, who once declared, “I am a long-distance runner. It takes me years and years and years to produce what I do.” Bourgeois made her greatest work after the age of 80. When she was 84, and an interviewer asked whether she could have made one of her recent works earlier in her

career, she replied, “Absolutely not.” When he asked why, she explained, “I was not sophisticated enough.”

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