

## Creativity and Genius

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In R. Reiter-Palmon & J. Katz-Buonincontro (Eds.),

*APA handbook of creativity*. Washington DC: American Psychological Association.

First draft not for citation or quotation

The phenomena of creativity and genius are simultaneously both closely related and highly disparate. Although creative genius might be considered the most prototypical illustration of either phenomenon, it is equally evident that not all creators are geniuses, nor are all geniuses creative, at least not in the sense of displaying creativity. Part of the reason for the disparities is that both creativity and genius can be defined in multiple ways, alternative conceptions that are sometimes unrelated if not outright incompatible. Yet here is an interesting fact that will greatly facilitate writing this chapter: Creative genius is much easier to define and discuss than either creativity or genius separately. The intersection of the two concepts accordingly becomes far more focused. That fortunate convergence will become apparent as this chapter unfolds.

I begin by discussing creativity, and then turn to the subject of genius. The chapter can then concentrate on creative genius.

### **Creativity**

Although the notion of “the Creator” has been around for centuries, we sometimes forget that human rather than divine creativity is a rather modern term. According to Google Ngram, the word “creativity” did not become common until after the mid-20th century, increasing in frequency in the 1960s. Indeed, Guilford (1950) is often cited as launching interest in creativity as a research topic – just two years after the author of this chapter was born! Given that this

chapter's author is still alive, that means that modern creativity literature may be completely contained within a single human lifespan.

This historical novelty may explain why creativity researchers have not yet settled on how creativity should be best defined (Plucker et al., 2004). Admittedly, many investigators will subscribe, at least nominally, to the so-called Standard Definition (Runco & Jaeger, 2012). This definition holds that creative ideas or responses must be both *original* and *effective*, where the latter criterion may signify usefulness, meaningfulness, appropriateness, value, and the like, largely depending on the specific domain in which creativity takes place. Yet calling this definition “standard” is a bit of a stretch because not everybody concurs on what criteria are absolutely essential. On the one hand, some creativity researchers would delete the effectiveness criterion, perhaps by broadening the originality criterion to encompass “intentional novelty” (Weisberg, 2015). If an idea is novel and it was intended to be novel, then it is creative even if it has no value otherwise (cf. Harrington, 2018). On the other hand, some researchers prefer to add a third criterion to the first two, such as surprise (e.g., Boden, 2004; Simonton, 2013; cf. Tsao, Ting, & Johnson, 2019). An idea may be original and effective but not surprising because it can be easily assimilated by existing knowledge rather than requiring more thorough accommodation via knowledge restructuring (cf. Shogenji, 2021). This criterion is comparable to the “nonobvious” requirement used by the United States Patent Office to supplement its novel and useful stipulations (Simonton, 2012).

As if these disagreements about creativity criteria were not enough, other researchers consider the foregoing definitions totally misguided. Some object to their emphasis on the creative idea or response, as collated in the creative product. In contrast, these investigators maintain that creativity should be defined in terms of the creative process, independent of

whether it yields such a product. For instance, “creativity is defined as internal attention constrained by a generative goal,” where “generative” signifies “not already precisely held in memory” and therefore productive rather than reproductive (Green, Beaty, Kenett, & Kaufman, 2023, p. 544). This definition has the advantage that it renders creativity more amenable to study via the techniques of cognitive neuroscience.

Yet other creativity researchers adopt the opposing view that creativity is not even located in the brain at all but rather depends on some social or cultural certification procedure. The classic example is Csikszentmihalyi’s (2014) systems model in which the individual’s ideas do not become part of the domain until first certified as “creative” by members of the field (see also Simonton, 2010). Notice that unlike the process definition, the systems model does not specify that a creative idea must be generated by a creative process. Hence, a purely serendipitous discovery that becomes part of a domain is deemed creative even if there was no “internal attention constrained by a generative goal.” A case in point would be Alexander Fleming’s discovery of the antibacterial properties of a specific blue mold that had inadvertently contaminated his petri dishes while he was away on a family vacation. No wonder, then, that some researchers argue that there is no such thing as a dedicated creative process or procedure (Baer, 2022; Simonton, 2023). Instead, there is a large inventory of diverse processes and procedures that generate originality without ensuring creativity (cf. Dietrich, 2019). Indeed, ordinary thinking often suffices in even the most historic cases of creativity (Weisberg, 2014).

Perhaps creativity is too complex to expect researcher consensus on its precise meaning (Simonton, 2015a). This complexity is probably why the phenomenon can be viewed from so many different perspectives. For example, Glăveanu (2013) offered the “5 A’s framework,” which entails actor, action, artifact, audience, and affordances, whereas Sternberg and Karami

(2022) later proposed the “8Ps,” namely, purpose, press, person, problem, process, product, propulsion, and public (cf. Rhodes, 1961). Or the conceptual pie can be sliced up according to the phenomena’s magnitude, such as the classic contrast between little-c or “everyday” creativity and Big-C or “genius” creativity (Luckenbach, 1986; Simonton, 2013), to which has been added mini-c and pro-c creativity (Kaufman & Beghetto, 2009). Although some modest overlap is evident among the As, Ps, and Cs, the disparities exceed the parallels.

All this complexity implies is that it behooves any creativity researcher to narrowly define the scope of their chosen treatment of the phenomenon. That is what takes us to the next section, where we examine genius.

### **Genius**

Unlike creativity’s relative modernity as a concept, or at least as a word in the English language, the word “genius” has a Latin origin that goes way back to antiquity. Indeed, it dates to the mythology of the ancient Romans. The genius was a guardian angel or protective spirit that was bestowed on each male upon birth (while a *juno* was assigned to a female). This rather narrow meaning expanded over time to assume more naturalistic significance. For example, an individual’s genius could refer to a special talent, such as displaying a genius for carpentry. The usage also thus became less gender specific. Women could have talents too. This connection between genius and talent gradually encompassed a significance more comparable to contemporary meaning. Most notably, the philosopher Immanuel Kant, in his 1790 *Critique of Judgement*, defined a genius as someone with an innate talent for conceiving products that were simultaneously original and exemplary. The latter qualification signified that the products offered models that attracted admiration and emulation from others. Kant’s idea is close to Kuhn’s (1970) notion of exemplars providing the basis for paradigms in science (albeit Kant focused on

the arts rather than the sciences). It was the exemplary nature of genius that helped separate originality from madness.

The first monograph devoted to the scientific examination of genius was Francis Galton's 1869 *Hereditary Genius*, which appears to take Kant's genius definition as his exemplar. For Galton saw genius in terms of enduring reputation as judged by "the opinion of contemporaries, revised by posterity ... the reputation of a leader of opinion, of an originator, of a man [or woman] to whom the world deliberately acknowledges itself largely indebted" (Galton, 1892/1972, p. 77). Galton's conception incorporated Kant's requirement of talent, just replacing the latter term with "natural ability." According to Galton, those "who achieve eminence, and those who are naturally capable, are, to a large extent, identical" (p. 78).

The ideas of Kant and Galton lead to a pair of dictionary definitions that can be later transformed into a single scientific definition.

### **Dictionary Definitions**

This Kant-Galton view of genius eventually appeared in standard dictionaries. For instance, in one dictionary genius is defined as "Native intellectual power of an exalted type, such as is attributed to those who are esteemed greatest in any department of art, speculation, or practice; instinctive and extraordinary capacity for imaginative creation, original thought, invention, or discovery" (*American Heritage Electronic Dictionary*, 1992). This can be taken as the primary definition in the English lexicon.

Unfortunately, from a scientific perspective, this definition has a major liability: Assertions are made by lexical fiat that are better considered empirical questions. These arbitrary assertions are twofold:

First, terms like “native” and “instinctive,” just like “natural,” imply that genius is born, not made. But is that true? Even Galton (1874) admitted that “nature” is complemented by “nurture” so that environmental factors also underly the emergence of genius. Thus, this assumption is best omitted from a scientific definition. That permits the impact of “nature” to be studied using contemporary behavioral genetics (Johnson & Bouchard, 2014; Lykken, 1998). Nature might be more important in some domains but less so in others (Simonton, 2008).

Second, the dictionary definition also claims that genius displays “intellectual power of an exalted type,” otherwise called extremely high intelligence in psychological terms. This claim becomes more explicit in a secondary definition in the same dictionary: A genius is “a person who has an exceptionally high intelligence quotient, typically above 140” (*American Heritage Electronic Dictionary*, 1992). It is noteworthy that the IQ 140 cutoff originated in an arbitrary decision imposed to restrict a longitudinal study of intellectually gifted children to the top 1% of the population according to a recently standardized IQ test (Terman, 1925-1959). That threshold had no empirical justification either then or later. After all, general intelligence is a continuous variable with an approximately normal distribution in the population. We could just as well use the top 2% threshold required for membership in Mensa, the high-IQ society. Accordingly, it is advisable to leave out the intellectual power bit in the primary definition, retaining it as an empirical question deserving of research rather than an a priori requirement.

That much given, it also should be acknowledged that genius is most strongly connected with those domains of achievement that demand a substantial degree of “intellectual power.” To be sure, Galton (1869) listed famous athletes in his compilation of geniuses, yet that listing was a conceptually careless carryover from his earlier study of “talent” (Galton, 1865). His notable wrestlers and rowers appear completely outclassed by his highly influential scientists, writers,

artists, and musicians, and even outclassed by the eminent commanders and politicians. No top-notch “wrestler of the North Country” comes close to a famous Prime Minister of the British Parliament and is even less proximate to a distinguished Fellow of the Royal Society. In domains displaying either creativity or leadership, considerable intelligence is necessary to master the domain-specific knowledge and skills for extraordinary accomplishments. Nevertheless, the requisite intellectual capacity may not match an IQ of 140 or more and thus cannot be considered “genius grade” by the secondary dictionary definition (Cox, 1926; Roe, 1953). In fact, illustrious military figures, such as generals and admirals, often exhibit IQs well below that threshold (Simonton & Song, 2009). Some would not even qualify for Mensa membership.

Finally, one feature of the primary dictionary definition must be made more explicit: To merit the status of “genius” the individual must contribute to an achievement domain that is highly valued in their culture. The positive cultural value of a domain is documented by major honors, awards, medals, commemoratives, memorials, anniversaries, monuments, appointments, patronage, grants, museums, archives, conservatories, academies, and other overt forms of societal recognition and support. In stark contrast, a domain is devalued culturally when it is condemned by social norms and even punished by established laws. Consequently, acclaimed creators and leaders can be called geniuses, but not grifters, embezzlers, assassins, mass murderers, serial killers, domestic terrorists, or drug lords. The latter are all destructive, not constructive, relative to the greater society in which they abide. By implication, an “evil genius” seems a contradiction in terms.

### **Scientific Definition**

The foregoing considerations can be consolidated into the following definition: “A genius is a person who makes original, exemplary, and enduring contributions to domains of

achievement that are both intellectually demanding and culturally valued” (Simonton, 2024b, p. 257, italics removed). The three essential attributes of the contributions are assessed by Galton’s “opinion of contemporaries, revised by posterity,” where the contemporaries can include colleagues, connoisseurs, consumers, curators, and critics, while posterity can include the last four of the former plus scholars, historians, archivists, etc. The actual judges making these assessments are contingent on the specific domain of achievement. The people who decide who gets the Nobel Prize for Physics are different from those who pick the Nobel Prize for Literature – and so on for the other Nobel prize categories.

Not surprisingly, the scientific definition entails refinements not found in either of the two dictionary definitions. For our purposes, the following two refinements are perhaps paramount.

First, because all components of the definition are necessarily quantitative rather than qualitative, genius is explicitly a quantitative rather than a qualitative phenomenon. In simple terms, genius can range from low to high. More specifically, not only does the number of contributions vary across geniuses, but the contributions themselves vary in how original, exemplary, and enduring they may be. Furthermore, achievement domains differ greatly in the degree to which they are intellectually demanding or culturally valued.

Second, given the quantitative nature of the definition’s components, any given genius may display a distinctive profile on those components – high on some, medium on others, and low on yet others. Hence, even within the same domain of achievement, genius is far from homogeneous. This heterogeneity echoes the word’s ancient significance where a person’s genius was taken as highly individualized, rendering genius *sui generis*.



Now that genius has been given a scientific definition, the next question is how to define creative genius.

### **Creative Genius**

As suggested earlier, many if not all the ambiguities involved in defining creativity may vanish once that concept is combined with genius. The key to this simultaneous integration and simplification concerns the notion of domain. Some domains involve achievement as leaders, and other domains involve achievement as creators. That implies the previous scientific definition needs only to be modified by adding the adjective “creative” in the appropriate places. Two such insertions yield the following: “A creative genius is a person who makes original, exemplary, and enduring contributions to domains of creative achievement that are both intellectually demanding and culturally valued” (Simonton, 2024b, p. 259, italics removed). Of course, this modified definition is incomplete until what counts as a domain of creative achievement is first specified.

There are numerous possibilities. The ancient Greeks attributed human creativity to the Muses who represented different domains. Although the details vary, there seemed to be Muses for poetry, comedy, tragedy, music, dance, history, and astronomy. Certainly that list is incomplete by current standards. So modern researchers come up with different lists. For example, the self-report Creative Achievement Questionnaire (CAQ) encompasses 10 domains, namely, visual arts, music, creative writing, dance, drama, architecture, humor, scientific discovery, invention, and culinary (Carson, Peterson, & Higgins, 2005). However, the CAQ does not focus on Big-C creativity, and indeed dips down to little-c creativity (see also Kaufman, 2012).

Investigators who concentrate on creative genius will often include technology, science, philosophy, literature, music, and the visual arts, with some of these domains split into subdomains, like poetry, drama, fiction, and nonfiction for literature, and painting, sculpture, and architecture for the visual arts (e.g., Kroeber, 1944; Murray, 2003; Simonton, 1975, 1997). However, these lists can betray ethnocentric bias if they exclude domains that are especially important in other civilizations. For instance, some non-Western civilizations consider calligraphy a major form of creativity (Simonton, 1988). Consequently, for researchers who seek a representative sample of creative geniuses, “culturally valued” will serve as a good sampling criterion. The major civilizations will not value identical domains (see also Simonton, 2018). Similarly, investigators should be sensitive to the fact that cultural values can change over historical time, subtracting or adding domains in which creative genius appears. A notable 20th-century example is how cinema emerged all over the world as the “seventh art,” thus augmenting the already established creative domains of poetry, sculpture, painting, architecture, music, and dance.

### **Degrees of Genius**

Whatever domains are decided upon, it is evident from what was specified earlier that creative genius is a continuous variable that goes from very low to very high. This quantitative continuity is often assessed by researchers using any of several historiometric techniques (Simonton, 2024a). These techniques include the amount of space received in histories and encyclopedias, biographies written, expert surveys, awards, performance frequencies, exhibitions, citation counts, box office, auction prices, sales figures, and others, but all depending on the specific domain. Most often these assessments will converge, yielding a composite measure with high reliability (e.g., Simonton, 1991). But other times the assessments will

diverge, signifying the existence of subdomains. For example, cinematic contributions can be partitioned into film as art and film as entertainment, the former pursuing the slow but steady arthouse circuit while the latter do the worldwide weekend release in multiplexes and megaplexes (Simonton, 2011). The first wins more awards, the second earns more money.

In any case, the first row of Table 1 indicates something of the range in the specific domain of Western art. At the apex is Michelangelo Buonarroti who is considered the progenitor of a whole stylistic school in the Italian High Renaissance, namely Mannerism. Admired by both contemporaries and posterity, he was sometimes called the “the divine one.” His painting, sculpture, and architecture still rank today among the most sublime achievements in human civilization – exemplars par excellence.

In contrast, one of his apprentices, the Mannerist Daniele da Volterra, can be plainly considered an epigone. His chief claim to fame occurred when he was commissioned to cover up the genitals that his now-deceased master had painted in the Sistine Chapel’s *The Last Judgment* – hence earning the derogatory nickname of “the breeches maker.” Aside from many highly imitative paintings, some solely based on his master’s surviving sketches, perhaps Volterra’s best-known work is a portrait painting of Michelangelo. But even Volterra’s bronze bust of his master was taken from Michelangelo’s death mask – direct postmortem imitation.

Besides those unfavorable qualitative comparisons, these two artists can be contrasted quantitatively according to a comprehensive historiometric rating of artists in Western civilization (Murray, 2003). Using 11 standard reference works, 479 could be identified as truly significant based on the space devoted to their life and work. These space measures were highly intercorrelated, yielding an impressive reliability coefficient of .95 (for a subset of 455 active since 1200 C.E.). Of these notables, 154 could be considered truly major figures, again according

to the same eminence indicators. To facilitate comparisons with geniuses in other domains, the measures were then transformed into a 100-point scale, the most eminent artist thus receiving a score of 100. That artist was Michelangelo. Where did Volterra place? Nowhere! He was no doubt included among the hundreds of artists who did not make it into the group of 479 significant figures (though he also wasn't included among the less select 772 in Simonton, 1984a). There was certainly no bias against Italian artists, for almost half of the top 20 most famous were also Italians, namely Raphael 73, Leonardo 61, Titian 60, Giotto 54, Bernini 53, Caravaggio 43, Donatello 42, and Masaccio 41. Plus, plenty more Italians received lower scores than the last, even as low as just 1, like Volterra's contemporary Francesco de' Rossi. Volterra represents a low-level creative genius, but not an absolute zero, perhaps a fraction of a degree above. His teeter-tottering on the cusp of obscurity is revealed in the fact that while Volterra enjoys a biographical entry in Vasari's three-volume *Lives of the Painters, Sculptors, and Architects*, that entry got omitted from the one volume abridged edition (Vasari, c. 1550/1968). He probably should have imitated his master a bit less to strike out on his own.

Presumably, according to the scientific definition, the quantitative variation in creative genius is some weighted function of the definition's separate components. These can now be examined in turn, again referring to the remaining rows in Table 1.

### **Original Contributions**

In most scientific domains, the Ph.D. has become the crucial certificate for becoming a creative scientist. The doctoral thesis certifies that a candidate can contribute original knowledge to their chosen domain. Yet it remains true that this originality requirement sets a low bar. Many if not most dissertations do not produce articles that are published in top-tier refereed journals, and a large number are never published anywhere because they are just not publishable. Compare

the dissertation's originality standard with that imposed by the selection committees that bestow the various Nobel Prizes in the sciences. No doubt the latter bar is set far higher. Although not all Nobel Laureates made honored contributions of equal merit, it is difficult to identify any recipient whose contribution's originality was no higher than the doctoral dissertation level.

That is the point of the second row in Table 1. Albert Einstein received the Nobel Prize for Physics in acknowledgement of his original contributions to theoretical physics, with his paper on the photoelectric effect receiving a specific mention. It was that paper that helped launch the quantum revolution. Yet the same year that he wrote that paper, he also finished the final version of his doctoral dissertation, a mere 18 pages that dealt with a new method for estimating the size of molecules. The method may have been new, but the specific problem was old. It is fascinating that Einstein apparently made no attempt to submit as theses his other articles published in that year, namely one on Brownian motion and two on the special theory of relativity – the third including the iconic  $E = mc^2$ . These were original solutions to original problems. Perhaps he thought they were too original to get signed off by his thesis committee. After all, the Nobel Prize committee delayed recognizing Einstein for several years precisely because relativity theory was too original, even violating classical physics.

To be fair, sometimes a doctoral dissertation exhibits prize-winning originality. Marie Curie's original thesis research on radioactivity directly justified her sharing the Nobel Prize for Physics in precisely the same year that her dissertation was signed off. Yet this event is rare. Most scientists would be thankful for receiving a mere best dissertation award.

Lastly, it should be noted that creative domains will often differ in how much emphasis is placed on originality. For instance, originality tends to receive more emphasis in the arts than in the sciences (Simonton, 2021). Indeed, the typical scientific journal article often seems to go out

of its way to establish that the reported research is firmly rooted in previous publications – hence the introductory literature review. In comparison, so-called “shock art” makes an unprecedented effort to push the boundaries of what is even considered artistic creativity. Specific examples probably should not be given in an academic handbook.

### **Exemplary Contributions**

The previous section shows that creative geniuses of even the highest order can produce contributions that vary immensely in originality. Einstein’s doctoral dissertation was far from the same level as other papers that came out in his *annus mirabilis*. The third row in Table 1 provides two illustrations of how the same variation applies to the degree to which a contribution is considered exemplary. In the case of William Shakespeare, the gap between *Timon of Athens* and *Hamlet* is huge (Simonton, 1986). The former play is mostly forgotten because it is far from a model for good drama. It is seldom performed and never imitated (this author has seen it produced by an excellent company, and it was still dreadful). The latter play, in stark contrast, is decidedly exemplary, frequently performed, reinterpreted, and adapted for other media, such as film and opera, plus inspiring subsequent plays, such as Tom Stoppard’s 1966 *Rosencrantz and Guildenstern Are Dead*. What actor doesn’t dream of delivering Hamlet’s famous soliloquy?

The gap between *Wellington’s Victory* and Beethoven’s Fifth is likely even larger. The Fifth needs little discussion, its opening “Fate knocks at the door” motive becoming perhaps the best known four-note sequence in all classical music. And its impact on popular culture is also conspicuous, from *Roll Over Beethoven* to *A Fifth of Beethoven*. In contrast, *Wellington’s Victory* is something of a musical monstrosity designed to celebrate a recent defeat of Napoleon’s forces in Spain. It had a huge and varied orchestra that made lots of noise in imitation of the battle itself, plus it was permeated with various national anthems. Although its debut was an enormous

success, and it proved very profitable, it's now considered a potboiler that is seldom performed or recorded today. Certainly not exemplary, but to Beethoven's credit, he never considered it to be among his best works. His status as a musical genius would not diminish one iota if he never composed the piece. Yet even geniuses must pay the landlord.

### **Enduring Contributions**

Again, column four in Table 1 illustrates the contrast between a short-lived contribution and a long enduring contribution with respect to a single creative genius, this time Charles Darwin. No doubt that the theory of evolution by natural selection has survived "the test of time." To be sure, it has undergone considerable development, especially in the form of the Modern Synthesis, which incorporates scientific advances unavailable in Darwin's day. Yet the gist remains the same. In contrast, because Mendel's genetic laws were not published until after Darwin published his theory, nor did they become widely known until long after he died, Darwin tried to come up with his own theory of inheritance: pangenesis. It was a disaster. Besides lending support to a competing theory – Lamarck's inheritance of acquired characteristics – it was experimentally disproven by his own cousin, Francis Galton, who had initially attempted to prove it! Hence, Darwin's status as a creative genius does not depend on this misguided theory.

The case of Gregor Mendel, though, raises the issue of "neglected genius," someone whose contributions were largely ignored by contemporaries only to become fully appreciated by posterity. In his case, it took 35 years for his ideas to win acceptance, and he died 16 years before that acceptance took place. This is where Galton's notion of reputation becoming "revised by posterity" comes into play. Nor does Mendel provide the sole example. Emily Dickenson's poems, Vincent Van Gogh's paintings, and, most recently, Florence Price's compositions, can also be cited as conspicuous examples. Even so, this phenomenon is relatively rare.

Historiometric research indicates that contemporary and posthumous reputation exhibit a respectable correlation, and that the posthumous reputation shows considerable stability across decades, even centuries (e.g., Ginsburgh & Weyers, 2006; Over, 1982; Rosengren, 1985; Simonton, 1991; see also Simonton, 1998). Admittedly, errors around the regression line always persist, but these can occur in either direction. Thus, the opposite of a neglected genius is a “faded genius” who was once a highly acclaimed creator but whose posthumous reputation falls far short of what they experienced during their lifetime. A prototypical example is Jean-Louis-Ernest Meissonier, a 19th century French painter and sculptor who attained fame for his historical depictions of Napoleon and other momentous events (Weisberg, 2015). Although his status in the pantheon of art has fallen on hard times, it remains true that he still can boast an extensive Wikipedia article and, most importantly, his paintings and sculptures still decorate museums and galleries around the world. For as long as that holds, Meissonier is always waiting in the wings for rediscovery via some major retrospective, however implausible that might seem today.

In fact, one of the most remarkable features of modern times is the frequent rediscovery of neglected or faded creative geniuses, especially those who hail from previously underrepresented groups. Florence Price is a favorite example for the simple reason that she was doubly disadvantaged, both as a woman and as an African American, in a domain where the field was overwhelmingly white male. Despite her obvious talents, prestigious training, and precocious successes, she ended up largely peripheral to the mainstream music scene until, over a half century after her death, boxes of old music scores were discovered in a dilapidated house that once served as her summer vacation home. Owing to recent performing, recording, broadcasting, and streaming, her neglected masterpieces have now entered the classical repertoire, ensuring her status among great 20th-century American composers.



Ultimately, posthumous reputation surpasses contemporary reputation for the simple reason that it can endure so much longer – several lifetimes rather than just one. Better a rediscovered neglected genius than a posthumously ignored faded genius.

### **Number of Contributions**

Turning to the fifth row in Table 1, let us start with Wolfgang Amadeus Mozart, who was no doubt extremely prolific as a classical composer, notwithstanding his early death at age 35. The Köchel numbers assigned his compositions exceed 600, averaging amply more than one composition per month – from birth! His output was so immense that concerts around the world could promote “mostly Mozart” performances that were sometimes 100% Mozart. Better yet, he contributed to so many different genres – solo, chamber, symphonic, religious, and operatic – that it is possible to feature mostly Mozart programs in almost any venue, from recital room to concert hall and from cathedral to opera house. The range and quality of his creative genius was such that the 1984 film *Amadeus*, which won eight Oscars including Best Picture, could use a soundtrack that consisted almost exclusively of Mozart’s compositions, the original two CD soundtrack recording then earning the Grammy for Best Classical Album.

Counterposed to Mozart’s prolific achievement is that of Johann Pachelbel, whose current fame rests almost entirely on a single, short composition, the *Canon in D* – a composition heard all over the world, in various arrangements, and especially at weddings and funerals. Pachelbel can thus be identified (or condemned) as a “one-hit wonder” (Kozbelt, 2008). Yet to be a bit more accurate, he might also be styled a faded creative genius. Pachelbel was very productive and influential in his day, but after his death in 1706 his work was increasingly viewed as old fashioned and fell out of favor, only a few minor keyboard and organ pieces still getting occasional performances (Barlow & Morgenstern, 1948). Then in 1968 a little composition for

three violins and continuo was arranged for string orchestra, with a somewhat modernized sound, and within a decade its popularity skyrocketed, eventually even influencing pop music.

Wikipedia even contains a striking entry entitled “List of variations on Pachelbel's Canon” that provides over three dozen examples. So the fact remains that for millions of music listeners, Pachelbel is only known for this single work lasting roughly six minutes. That is why we don't see “particularly Pachelbel” concerts to rival those featuring Mozart. Not enough music to fill a two-hour program, at least not if the goal is to sell tickets. Interestingly, some tentative evidence suggests that this piece may have been written for a wedding he attended – a *pièce d'occasion*!

The number of notable compositions is obviously a ratio scaled “count” variable, so many creative geniuses will occupy a more middle position between the most prolific and the one-hit wonders. This range is illustrated in a calculation of performance percentages in classical music (Moles, 1958/1968). At the top of the list are Mozart 6.1%, Beethoven 5.9%, and J. S. Bach 5.9%, that triad thus accounting for almost 18% of all performances. The top 16 most performed composers account for half of the performances, and the top 36 account for three fourths. By that last point in the ranking each composer is credited with much less than 1.0% of the performances. The top 100 composers contribute 94% of the performances, with a residual of 150 unnamed composers responsible for the remaining 6%, or *almost* the same as Mozart solo! Those bottom 150 contributed only one work each, thus making them one-hit wonders. Given that this compilation took place before the *Canon in D* was rediscovered, Pachelbel probably did not make into the sample of 250 classical composers likely to be performed.

It is worth noting that these performance percentages correlate .72 with historical eminence ( $N = 696$ , Simonton, 1991). Who are the three most eminent? Beethoven 100, Mozart 100, and J. S. Bach 87 (Murray, 2003). Suitably, Pachelbel gets a 4, courtesy of the *Canon*.

### **Domain Intellectually Demanding**

The last two rows of Table 1 switch the unit of analysis from the individual or contribution to the entire domain in which the genius creates. The first point is that domains vary in their intellectual demands. Limericks were selected to illustrate the low end. All are in a simple fixed form designed to be sung like a drinking song, and they often tend to be extremely vulgar, either explicitly or by insinuation – decidedly low-brow humor. The title of Edward Lear’s contribution to the form is telling: just nonsense! This volume will provoke some chuckles without inspiring any further thought, at least not one of any seriousness.

Limericks are contrasted here with philosophy, using Ludwig Wittgenstein’s posthumous *Philosophical Investigations* as the illustration. As anyone can testify to who has tried to tackle this volume (including this author, who encountered few difficulties with his earlier *Tractatus Logico-Philosophicus*), this is not an easy intellectual challenge. Wittgenstein was an extremely deep thinker, someone who required that the reader rethink how they think. Naturally, many other philosophers could have been cited to prove the same point, from Plato and Aristotle to René Descartes and Georg Wilhelm Friedrich Hegel. It is no accident that philosophers boasted the highest estimated IQs in a large sample of historical geniuses (Simonton & Song, 2009).

Admittedly, the domain of philosophy, precisely because of its relative intellectual inaccessibility, might not enjoy the wide-spread impact of less demanding domains, such as novels or architecture. Even so, the genius of a great philosopher can be appreciated without being completely understood. Perhaps one basis for this appreciation is that philosophy, in some civilizations at least, is also highly valued. This value was especially conspicuous in Chinese, Indian, Islamic, and Western traditions (Kroeber, 1944; Murray, 2003; Simonton, 1975, 1988, 2018). This point takes us to the final component.

### Domain Culturally Valued

The last row in Table 1 illustrates the contrast in cultural value for creativity in the visual arts, sculpture in particular. On the low end, there is a pleasant carving that might be purchased at a crafts fair or souvenir shop, a carving that fits perfectly in some hitherto vacant spot in the house. Perhaps it even has the artist's signature engraved on the base. But there will come some day when the home is redecorated, or the owners move away, and that same carving ends up either in an upstairs attic or on some folding table in a garage sale, at a price far below what the piece originally cost. That is just the fate of such knickknacks, the creative expertise of the artisan notwithstanding. And much fine craftwork will end up in landfills, no longer saved by any sentimental value.

On the high end, monuments enjoy a more auspicious existence, as exhibited by Frédéric Auguste Bartholdi's 1886 *Statue of Liberty*. The monument could not be more conspicuously placed in New York Harbor, there to be widely viewed from multiple angles. Millions of immigrants to the United States had to go right by it on the way to Ellis Island for processing. And today vast numbers of visitors wait in long lines for the privilege of getting to the crown for a phenomenal view from above. Well maintained with all the required renovations, and featured on postal stamps and souvenir postcards, if it had been destroyed on 9/11 2001 instead of the Twin Towers not far away, is there any doubt that it would have been rebuilt almost immediately? The statue is the embodiment of cultural value not just in the United States but also in much of the world as a symbol of freedom. The Berlin Wall featured many images of *Liberty*.

Not every culture highly values philosophy, calligraphy, or a few other domains, but it is interesting that monumental constructions appear as close to a cultural universal as perhaps conceivable. Once people attain a sufficient population and economic base, this creative urge emerges early in cultural evolution (Carneiro, 1970). Even on the relatively small and remote

Easter Island, the Rapa Nui culture accumulated sufficient resources to carve, transport, and erect nearly a thousand very impressive moai. Monumental creations can be found all over the world, in various forms, with pyramids occupying a conspicuous place in both the Eastern and Western hemispheres. Certainly the Seven Wonders of the Ancient World were all monumental in scope. Indeed, the *Colossus of Rhodes* created by Chares of Lindos in 280 B.C.E. seems a worthy anticipation of the *Statue of Liberty*. Appropriately, the notable poem by Emma Lazarus, later added on a bronze plaque inside the monument, is entitled “The New Colossus.”

Undoubtedly, monumental sculpture and architecture seldom stand out for originality. The emphasis tends to be on tradition. Think of all the monuments in the Western world that are in a strictly neo-classical style, with tall Greek columns and other time-honored memes. Yet as said before, the components of the scientific definition are quantitative and thus exhibit tradeoffs when determining the magnitude of creative genius. In the current example, Bartholdi’s body of work was very conservative by design. So contrast his output with that of his near contemporary French artist, Auguste Rodin, creator of the iconic *The Thinker*, which emerged about the same time as *Liberty*. Although intended for a monument, Rodin’s creativity is clearly more original, so much so that he is often considered the founder of modern sculpture. That originality also ensured that Rodin would earn a much higher posthumous reputation. Hence, he received a score of 24 on the 100-point scale mentioned earlier (Murray, 2003). In contrast, Bartholdi did not even score a 1, and thus failed inclusion among the significant 479, nor did he make it into a larger sample of 772 Western artists (Simonton, 1984a). Probably many more people can identify Rodin as the creator of *The Thinker* than can name Bartholdi as the maker of *The Statue of Liberty*. The latter’s creativity is nondescript, lacking the uniqueness associated with genius.

## **Two Further Questions**

From the above detailed presentation of the contents of Table 1, the proposed scientific definition of creative genius should have become clarified. Of course, many fine details remain to be worked out. How are the several components best measured and how are these measurements optimally integrated to capture the complexity of this concept? That enterprise is better left for future research. However, to facilitate those forthcoming endeavors two questions should be addressed right now. First, how does genius in creative domains operate differently from genius in other domains, especially those emphasizing leadership? Second, how does creative genius differ from other kinds of creativity that do not attain genius levels?

### **Creator Genius versus Leader Genius**

When it comes to leadership, several domains can produce individuals who satisfy the scientific definition of genius. Common examples include political leaders (both status quo and revolutionary), military commanders (generals and admirals), religious figures (both established and new faiths), and entrepreneurs (especially those who generate new and successful enterprises from scratch). Although these forms of genius are every bit as diversified as creative genius, they also tend to exhibit characteristics that set them apart. One conspicuous difference is that leaders almost always establish their reputation within their own lifetimes. If they were really “neglected,” then they were not leaders. They must truly be the right person at the right place at the right time to qualify at all. Neither overlooked legislative reforms nor ignored decisive battles are ever discovered in dusty boxes either. One minor exception to this tendency comes from those historic figures whose eminence becomes intensified through martyrdom. Yet even those unfortunates usually claimed a significant following at the time of their ultimate sacrifice for the cause. Although we tend to associate martyrdom with religious leaders, a tragically early death,

especially by assassination or other violence, may enhance posthumous reputation in political leaders as well (Simonton, 1976, 1984b, 1986b).

The last observation suggests that eminent leadership may be a bit more dangerous than eminent creativity. To illustrate, among over a thousand deceased 20th-century heads of state, 11% died by either assassination or execution (Ludwig, 2002). This mortality hazard ensues from the fact that such leaders often contribute to cultures or subcultures that are in conflict. After all, societal systems and their components may differ dramatically in ideologies, religions, economies, ethnicities, histories, and the like, and these differences can motivate conflicts that escalate into violence, whether domestic or international. Indeed, military genius is impossible without a war to manifest it: How many would-be military geniuses never did anything more than joint maneuvers and war games? In any event, hostile heterogeneity means that while a person might be hailed as “*the Great Leader*” by some, that same person might be vilified as a vicious tyrant by others (see, e.g., Lord Byron’s vitriolic *Ode to Napoleon*). Parallel cultural contrasts can appear for other domains of leadership, but especially for religious figures.

Complicating evaluations even more are the differences among subcultures within the larger society. In United States history, for example, although Black minority culture and White majority culture agree regarding most minority-culture achievements, for obvious reasons civil rights activists are far more highly acclaimed by the Black minority (Simonton, 1998). Even Martin Luther King remains a far more controversial figure in some parts of the country and among certain political orientations. What this all means is that the appraisal of genius in leadership domains is much more contingent on which culture provides the reference group. The appraisals are then more vulnerable to ingroup-outgroup biases.

## **Creative Genius versus Everyday Creativity**

Returning to creative genius, or Big-C creativity, it is tempting to view this status as part of a continuum from little-c creativity, with perhaps mini-c creativity occurring earlier and pro-c (professional) creativity taking place between little and big (e.g., Dumas & Kaufman, 2024; Kaufman & Beghetto, 2023). This upward progression is implicit in the CAQ mentioned earlier, which rank orders creative achievements from initial talents to the threshold of universal acclaim (e.g., review or recognition in a national publication; Carson, Peterson, & Higgins, 2005). Furthermore, this positive monotonic growth no doubt occurs in many instances, and the developmental trajectory may even prove the most frequent, at least for certain domains. Prime examples are found in the cohorts in the Studies of Mathematically Precocious Youth (Kell & Lubinski, 2014). Identified at an incredibly early age, these youths most often accelerated rapidly through both educational and professional development in a continuous trajectory.

Perhaps the best specific case is that of Terence Tao, who was already taking university-level math courses at age 9, and just a year later became the youngest competitor ever in the International Mathematical Olympiad, winning progressively more impressive medals over the next three years and becoming the youngest recipient in doing so each time. Earning his bachelor's and master's a few years later, he went on to get his PhD from Princeton University at age 21. Three years after that, he advanced to full professor at UCLA, becoming the youngest person ever to receive such a promotion at that institution. Then just 10 years after earning his doctorate he won the Fields Medal, sometimes called the "Nobel Prize for Mathematics." There were apparently no bumps, even less obstacles, along this upward path to fame.

Yet there are plenty of counterexamples. The neglected geniuses mentioned earlier never managed to become professionals in their creative domains. Dickenson, Van Gogh, and Mendel



were strictly amateurs, and Price's career was relatively marginalized. Even Einstein was diverted to serving as a minor examiner at the Swiss patent office for several years, not assuming an academic position until he was 30 years old. The developmental discontinuities are even more obvious in the case of "late bloomers" whose creative genius lies dormant for most of their lives before suddenly coming into fruition. Grandma Moses provides a well-known illustration. Engaged in embroidery for most of her life, she sadly found that craft hobby thwarted by arthritis. Switching to painting, she discovered a hidden voice that would eventually produce popular works that ended up depicted on a US postage stamp and hanging on a wall in the White House – besides earning her lots of cash. Although her career did not really launch until she was already 78 years old, she fortunately lived to 101, allowing her a much longer career than might be expected otherwise. Indeed, she finished her last painting just the year before she died!

Finally, we must acknowledge that some persons may show considerable creative promise very early in life but then find their further development arrested for one reason or another. The extreme instance of this are child prodigies in creative domains who never grow up to become professionals, even less geniuses (Winner, 2014). William James Sidis, for instance, was a mathematical and linguistic prodigy who at age 11 enrolled at Harvard University, then the youngest to ever do so (Montour, 1977). He immediately attracted attention when he delivered a lecture on 4-dimensional bodies before the Mathematics Club that ranked him at the level of a Harvard graduate student. Yet after his graduation at age 16 – and not always with stellar grades – he eventually lost all interest in mathematics, pursued a variety of unrelated topics, none with any eminent success, and died at age 56. A Google Scholar search yields a few dozen citations and just two patents, granted in his early 30s, both for inventions regarding perpetual calendars – certainly not a highly valued domain culturally. He was not Terence Tao!

## Conclusion

Perhaps it should not surprise that creative genius does not seem to display the developmental continuity expected of ordinary creativity (see also Simonton, 2016). The formal definition of the former advocated here is not conceptually isomorphic with any definition of creativity presented earlier. Although the exemplary criterion might encompass useful and even surprising, that component does not explicitly do so. Even originality, which constitutes the only common term, is far from equivalent. It is one matter to make a personal judgment, perhaps even obtain a local consensual assessment, quite another to have originality widely acclaimed by contemporaries and posterity. Moreover, some aspects of the creative genius definition have no counterparts with any definition of ordinary creativity. The latter is not expected to be long-enduring, nor is there any stipulation that creativity appears in a domain that is intellectually demanding or even culturally valued. On the contrary, researchers tend to adopt the most accessible and relatively generic problems that in principle could be solved by any research participant anywhere in the world. Most often, no domain-specific expertise is required, and no solution produced is ever going to be evaluated beyond the particular empirical study. Has any unusual use for a brick or paper clip ever been patented?

The relation between creativity and genius becomes even more ambiguous when it is acknowledged, as noted earlier, that a person does not have to use a dedicated creative process or procedure to manifest creative genius. Thomas Edison once said that genius was 99% perspiration and only 1% inspiration, an assertion richly illustrated by his own brute-force working habits throughout his career (Simonton, 2015b). However much he might be denigrated for lacking creative imagination, particularly in comparison to his archrival Nikola Tesla, the fact remains that he was the greatest inventor of all time (viz., scoring 100 versus Tesla's 18 in

Murray, 2003). Whenever someone turns on a light, listens to recorded music, or watches a motion picture – even if now using their modern functional versions – that person is using a technology first invented, patented, and marketed by Edison. Even this inventor’s failed inventions were amazingly prescient, such as the fuel cell and the electric automobile. He also made one discovery in pure science, namely the Edison Effect, which was not fully understood for decades. The inventor was ahead of his time, the pedestrian “process” be what it may.

By now it should be apparent that creativity and genius constitute related but still distinct phenomena, and their distinction becomes accentuated in the phenomenon of creative genius. Hence, future research should articulate the details of their similarities and contrasts. For example, that research must explain why the “mad-genius” may frequently occur despite an often-negative relationship between ordinary creativity and psychopathology (Simonton, 2019). That research will require that investigators apply a diversity of methodological techniques to a variety of samples, ranging from little-c to Big-C creators.

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Table 1

*Implicit Quantitative Variation in the Creative Genius Definition and Its Components*

Definition component	Very low	Very high
Creative genius	Epigones (e.g., Daniele da Volterra “the breeches maker”)	Progenitors (e.g., Michelangelo “the divine one”)
Original contribution	Most doctoral dissertations in the sciences (e.g., even Einstein’s)	Most Nobel Prize winners (e.g., Einstein’s photoelectric effect)
Exemplary contribution	Shakespeare’s <i>Timon of Athens</i> ; Beethoven’s <i>Wellington’s Victory</i>	Shakespeare’s <i>Hamlet</i> ; Beethoven’s <i>Fifth Symphony</i>
Enduring contribution	Darwin’s pangenesis theory of heredity (obsolete in his lifetime)	Darwin’s natural selection theory of evolution (still prevails today)
Number of contributions	The “one-hit wonders” (e.g., Pachelbel and his <i>Canon in D</i> )	The prolific: many masterpieces in multiple genres (e.g., Mozart)
Domain intellectually demanding	Limericks (e.g., Edward Lear’s <i>The Book of Nonsense</i> )	Philosophy (e.g., Wittgenstein’s <i>Philosophical Investigations</i> )
Domain culturally valued	Crafts (e.g., hand carved statuette as accent piece for home décor)	Monuments (e.g., the Statue of Liberty in New York Harbor)

*Note.* Table adapted from D. K. Simonton (2024). Transformational creative genius: Four wise considerations of three definitions. In R. J. Sternberg & S. Karami (Eds.), *Transformational creativity: Learning for a better future* (pp. 255-266). Switzerland: Springer Nature. Adapted with permission.