

## Family Background and Genius

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**Objective:** It is widely believed among professionals and laity that genius is born and not made. However, the early and still-influential statistical studies of Frances Galton on the inheritance of genius have neither been supported nor definitively refuted. This study empirically assesses the hereditary transmission hypothesis.

**Methods:** We collected family background data on 50 Nobel Prize laureates in literature, 31 Booker Prize awardees, 135 Pulitzer Prize winners, and 20 National Book and National Book Critics Circle awardees. We compared these for incidence of occupational inheritance (that is, same parent–child occupations) with a matching group of 392 eminent persons in noncreative occupations; for predominant occupation type, we also compared subject data with data for 560 high-IQ nonprizewinners, as well as with general population occupational data.

**Results:** Incidence of one or both parents in the same occupation was only 1% for literary prizewinners but 16% for eminent noncreative persons ( $P < 0.0001$ ). The predominant (76%) family background constellation for prizewinners consisted of parent–child sex congruency either in applied-equivalent occupations requiring language, persuasion, or artisan skills ( $P < 0.0001$ , compared with control subjects) or in unrelated occupations with unfulfilled wishes for creative expression.

**Conclusions:** Outstanding literary prizewinners do not manifest direct inheritance of creativity from their parents; instead, parents and children of the same sex are predominantly in applied-equivalent or performance occupations and have unfulfilled creative wishes. We suggest that early developmental influences on child motivation involve identification and competition with the parent of the same sex.

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### Clinical Implications

- There is no evidence for direct inheritance of creativity or genius. The finding applies to healthy processes and therapeutic facilitation of creativity, psychiatric treatment of creative persons, and genetic counselling.
- Factors related directly to creativity, such as exceptionally intense motivation, should be differentiated from aberrant factors and psychopathology.
- In childhood development of creative persons, intergenerational competition and the adoption of a parent's implicit and explicit creative goals may be accepted and fostered.

### Limitations

- The findings are based on resemblance criteria (that is, similarities between parental and offspring behaviour), rather than on gene transmission.
- The main finding is based on test and control group evaluations, but supplementary findings are based on assessments with comparison groups.
- Data regarding the grandparents of the literary prizewinners, control subjects, or comparison groups are not assessed.

**Key Words:** *creativity, genius, heredity, motivation, genetic counselling, occupational inheritance, literary prizewinners, creativity and mental illness*

The idea that geniuses are born and not made is strongly ingrained. The popular and professional belief in this idea was given lasting impetus by the seldom-reassessed work of Francis Galton, an influential psychologist of the 19th century. In an early application of statistical methods in psychology, Galton claimed to provide evidence for the inheritance of genius from fathers to sons (1). This was based on data regarding eminence and what is today called “occupational inheritance” (2). In Galton’s sample, 48% of eminent sons had eminent fathers; 51% of these eminent sons had their own eminent offspring. Other familial linkages of eminence, such as siblings and cousins, were also reported. In her study of 301 geniuses, Cox purportedly corroborated Galton’s findings by showing that the largest percentages came from the middle and upper classes (3). Simonton refuted her results by applying more rigorous and sophisticated statistical measures to the raw data she reported (4). Cattell used a different approach of measuring historical and geographical distributions of eminent men and women (5). He concluded, on the basis of statistically distinct temporal and national distribution patterns, that heredity was a more efficient cause of eminence than both physical environment and social tradition. On the basis of longitudinal studies of high-IQ California children, Terman and his group reported presumed “indirect evidence of inheritance” (6), because a high proportion of the children’s family members were listed in the *Cyclopedia of American Biography* or *Who’s Who*. Clarke, however, found that only 1% of prominent US men of letters early in the 20th century had parents in a creative profession (7). Bramwell attempted a follow-up of Galton’s study and found that only the eminent judges clustered into family configurations (8). Overall, researchers studying features of family backgrounds of eminent persons since Galton, have neither supported nor definitively refuted the heredity belief.

In this study, we trace family background patterns pertinent to the hypothesis of hereditary transmission of genius or creativity, by assessing the family background data of 20th century outstanding literary prizewinners: Nobel Prize laureates in literature (NP), Pulitzer Prize awardees (PP), Booker Prize awardees (BP), and winners of the National Book Award (NBA) or National Book Critics Circle Award (NBCCA). One confounding factor in many of the previously cited studies was the use of any type of eminence as a criterion of genius. In many fields, eminence or celebrity is achieved for many reasons other than the special qualities of talent and mind associated with genius. We use creative achievement as an operational definition for a type of genius.

To assess inheritance factors in creative achievement, we first compared family background data of the literary prizewinners with data for a group of eminent persons from other fields. Based on these results, and on previous research showing

complex family patterns with outstanding creative persons in several fields (9–12), further assessments were made: we compared the literary prizewinner group both with the general US population and with Terman’s high-IQ group; we further explored family background data within the literary prizewinner group.

## Assessment I

We determined the presence or absence of occupational inheritance (that is, the child follows one or both parental occupations) among literary creators. The factor of eminence was controlled through a comparison of outstanding literary prizewinners with a matching group of eminent noncreative achievers. Occupational inheritance in the US overall, according to the US Bureau of Census measurement, consists of 21% of all men following the same occupation as their fathers (13).

## Method

We collected background occupational data from every published English-language biography to determine an assessment group of outstanding literary prize winners for the years 1900 through 2000. The group consisted of 236 subjects: 50 Nobel Prize laureates, 31 Booker Prize awardees, 135 Pulitzer Prize winners in Poetry, Fiction, or Drama, and 20 combined NBA and NBCCA winners. There were 180 men (76%) and 56 women (24%) in the group. Many subjects had won more than one of the prizes, and overlapping data were excluded. Nobel laureates came from a broad distribution of ethnic and geographic backgrounds throughout Europe, the US, Latin America, the Middle East, Africa, and Asia. Booker Prize winners were citizens of the British Commonwealth or the Republic of Ireland. In the remaining categories all were US citizens, although some were born elsewhere. Offspring data, which would not apply to all members of the subject group, were not collected.

We collected control group data from the biographical studies of eminence by Goertzel and Goertzel (14,15) regarding 392 eminent 20th century persons from fields other than literature, art, and music. Ethnic backgrounds were similar to those of the assessment group, with a broader range of countries representing Asia. There were 314 men (80%) and 78 women (20%). A wide range of fields were represented, with subjects achieving eminence in such areas as government, business, entertainment, religion, social welfare, sports, and military service. Among this group were Jomo Kenyatta, Ho Chi Minh, Gerald Ford, Estes Kefauver, Emma Goldman, Louis Renault, Eve Arden, Joe Namath, Lawrence Welk, and General George Patton.

**Table 1 Distribution of occupational types in the literary creative and eminent noncreative (NC) groups**

Occupation type	Creatives	Eminent NC	Creatives	Eminent NC
	Father <i>n</i> (%)	Father <i>n</i> (%)	Mother <i>n</i> (%)	Mother <i>n</i> (%)
Professional	82 (35)	137 (35)	41 (71)	35 (49)
Commercial	89 (38)	110 (28)	10 (17)	12 (17)
Industrial	45 (19)	96 (24)	6 (10)	22 (31)
Public service	20 (8)	49 (13)	1 (2)	2 (3)
Total	236 (100)	392 (100)	58 (100)	71 (100)

**Table 2 Parents in same occupation as offspring in creative and eminent noncreative (NC) groups**

	Creatives <i>n</i> (%)	Eminent NC <i>n</i> (%)
Fathers	1 (< 1)	41 (10)
Mothers	0 (0)	17 (24)
Both parents	1 (< 1)	3 (11)
Total	2 (< 1)	61 (16)

**Table 3 Performance occupations (linguistic, persuasive, artisan)**

- Bookseller
- Clergy: minister, priest, rabbi
- Education, teacher
- Journalist
- Lawyer, lawmaker, law clerk
- Linguistics
- Missionary
- Notary
- Potter, cabinet maker
- Publisher, editor
- Salesperson
- Scholar: biblical, professorial
- Telegraph communication
- Theatre: actor, production, management, investments

## Results

To determine whether the assessment and control groups were comparable with respect to types of occupations, we calculated the distribution in categories as defined by the US Bureau of Census. These categories were professional (P), commercial (C), industrial (I), and public service (PS). The distribution of fathers' occupations for the assessment and control groups was slightly different (Table 1), with a larger proportion of fathers of literary prizewinners following commercial pursuits than in the control group. Overall differences between the groups were nonsignificant.

With respect to mothers' occupations, a much larger proportion fell into the professional category in the literary prizewinner group. However, statistical significance of this difference could not be assessed because—except for the broad, nonspecific category of “homemaker”—mothers' occupations were only reported for approximately one-fifth of subjects in both groups.

Distribution of subjects having the same occupation as one or both parents was calculated for both the assessment and the control group. In the group of literary prizewinners, only 2 subjects had parents who were creative writers (1 subject's father and 1 subject's father and mother) (Table 2). There is little or no overall association of parent and offspring occupations among the creative group, compared with those in the eminent noncreative group ( $\chi^2 = 35.34$ , *df* 1, *P* < 0.0001).

## Assessment II

The results of Assessment I clearly show an absence of direct occupational inheritance among eminent literary prize-winners. Beyond that, previous research on outstanding creative persons in literature, art, and science (9–11) suggests a different type of familial linkage in creative persons: the characteristic occupation of the parent-child same-sex relation was an applied or performance equivalent of the offspring's field of creative achievement. For example, playwright Eugene O'Neill's father was an actor, physicist Albert Einstein's father was an electrician, novelist Pearl Buck's mother was a missionary, composer Wolfgang Mozart's father was a music teacher, and artist Pablo Picasso's father was an art teacher. We assessed this hypothesis separately.

## Method

For the literary prizewinner group, we calculated the presence or absence of a parent with an applied or performance-equivalent occupation. Applied or performance occupations related to literary creativity were defined as those involving predominant use of 1 or more of 3 key factors: 1) language and language skills, 2) persuasion, and 3) artisanship. The parental occupations of this kind found in the literary prizewinner group, are shown in alphabetical order in Table 3. For this assessment, the incidence of parents in performance occupations was compared with the overall incidence of persons in similar occupations throughout the entire US (as derived from the 2000 Bureau of Labor Statistics report). We also compared the incidence of performance occupations for the parents of a related group: subjects in the Terman longitudinal study of 560 high-IQ children. As measured by IQ scores, intelligence has been determined to be not directly correlated with (that is, independent of) creativity (16,17).

**Table 4 Performance occupations in literary, high-IQ, US workforce groups**

Group	Performance	Total <i>n</i>
Nobel laureates	24	50
Booker awardees	16	31
Pulitzer Prize	62	135
NBA and NBCC	10	20
All literary prizewinners	112	236
Terman high IQ	146	560
US Bureau of Labor	14 400 280	127 274 000

### Results

In the NP subgroup, 48% had one or both parents in a performance occupation; in the PP subgroup, 46%; in the BP subgroup, 52%; in the NBA and NBCCA subgroup, 50%. Overall, 47% of the group had one or both parents in a performance occupation. There was no significant association with either sex ( $\chi^2 = 0.1903$ , *df* 1,  $P = 0.66$ ). However, whether the prize-winner was male or female, the parent with the performance-equivalent occupation was predominately (85%) of the same sex. There was no significant association of performance occupations with any of the following 4 ethnographic groupings: US; Anglo and (or) British Commonwealth, including Ireland, Australia, and New Zealand; European; or others ( $\chi^2 = 6.2062$ , *df* 3,  $P = 0.10$ ).

Numbers of subjects with parents in performance occupations in the literary prizewinner test group and in the Terman gifted-child group, and the calculation of all working persons in performance occupations in the US (derived from the Bureau of Labor Statistics), are shown in Table 4. For the Terman and US Census groups the percentages are 26% and 12%, respectively. Performance occupations of parents are significantly associated with the literary prizewinner group ( $\chi^2 = 428.77$ , *df* 2,  $P < 0.0001$ ). For each of the types of prize-winners (NP, BP, PP, NBA and NBCCA), there were no significant differences.

### Assessment III

Parental performance or applied occupations, rather than the same occupations (as shown in Assessment I), characterize the literary prizewinner group. The difference between the literary and Terman high-IQ groups points to a specific link between the family-background factor and creativity (rather than intelligence per se). Findings in previous interview and biographical research (9–11) suggest that the development of creativity is facilitated by this occupation pattern together with another factor—parents' unfulfilled wishes for creative production and achievement. A family-background constellation consists of one or both factors operating: the parent of the same sex as the

child, whether in a performance-equivalent or remote (nonperformance) occupation, harbours long-term, unfulfilled wishes for creative achievement. This is manifested by frequent storytelling, writing chronicles, repeated attempts at writing poetry or fiction, and (or) expressing interests in a literary career. In addition, the parent who is of the opposite sex of the child, whether in a remote or performance-equivalent occupation, shares the interests of the parent who is of the child's sex or has also had unfulfilled personal wishes for creative achievement. The influence of such unfulfilled wishes during a creative person's development, especially from a parent in a remote occupation or from the parent of the opposite sex, may not be obvious or overt but may be even more motivating than the effects of parental performance occupations.

### Method

Reports indicating parental unfulfilled creative wishes and interests were collected from every published, full-length, English-language biography of members of the literary prizewinner group. For example, the novelist Pearl Buck's mother, who was a missionary, wrote poetry that was never published; the poet James Merrill's father, who was a stockbroker, invented elaborate short stories, also unpublished; to support his family, poet and novelist Robert Penn Warren's father postponed his own lifelong ambitions to be a poet. Such wishes, which were reported frequently throughout confidential research interviews with outstanding creative persons (9–11), were likely underreported in published biographies.

### Results

We calculated separately the unfulfilled creative wishes in connection with a remote occupation and those connected with a performance occupation. Table 5 shows the incidence of literary-group parents manifesting unfulfilled creative wishes with each type of occupation. As might be expected, a considerable proportion of performance-occupation parents were reported as having unfulfilled creative wishes, but the percentage is even higher in remote occupations. We combined all literary-group parents in a performance occupation with the remaining remote-occupation parents having unfulfilled creative wishes to present the nonoverlapping percentage of family background influences on creativity: NP 76%, BP 68%, PP 63%, NBC and NBCCA 70%, and overall 67%. Differences between the various literary awards were not significant. Sex distribution of the constellation for prizewinners was virtually identical: 66% men and 63% women.

For all parents with unfulfilled wishes, in both performance and remote occupations, 68% were of the same sex as the prizewinner. However, the incidence of such wishes in parents of the opposite sex is unclear, either because of underreporting or because of spillover effects between the parents.

**Table 5 Unfulfilled wishes with performance and remote occupations**

Unfulfilled wishes	Nobel <i>n</i> (%)	Booker <i>n</i> (%)	Pulitzer <i>n</i> (%)	NBA and NBCC <i>n</i> (%)	Total <i>n</i> (%)
With performance occupation	11 (46)	6 (37)	17 (27)	4 (40)	38 (34)
With remote occupation	14 (56)	5 (33)	23 (32)	4 (40)	46(37)
Total remote and performance	25 (50)	11(35)	40 (30)	8 (40)	84 (36)

NBA = National Book Award; NBCC = National Book Critics Circle Award

Among parents in remote occupations with unfulfilled wishes, there was no concentration in any particular type of occupation. Their distribution among types of occupations was similar to that found for the control group as reported in Table 1: 31% professional, 43 % commercial, 12% industrial, and 12% public service.

## Discussion

These findings showing minimal occupational inheritance contradict Galton's thesis of direct hereditary transmission of eminence and genius. Galton's findings were strongly influenced by the British practice of primogeniture (favouring the adoption of a father's occupation) and by his inclusion of simply well-respected persons as geniuses (for example, jurists and military commanders) (1). Also, Cattell's inferences about inherited eminence tend to be contradicted, because the findings here are derived from subjects of different cultures and ethnicity and data were gathered over an extended time period (from 1904 and 1917 onward in the case of Nobel Prize winners and Pulitzer Prize winners, respectively [5]).

Although the comparison groups for Assessments I and II were not, as with the test group, selected by award committees, criteria used in all cases were empirically derived. The Goertzel and Goertzel (16,17) eminent persons were all subjects of at least 2 major published biographies in English. The English-language publication factor, used here for comparison of subject and control groups, necessarily limited the number of early 20th-century and nonanglophone Nobel laureates studied. The categories of performance occupations, also empirically derived from test-group distributions, were applied in calculating the incidence of same occupations from the Bureau of Labor Statistics data. These data were not underestimated; they included any possibly related performance-type occupation, as well as the very large group of US teachers of all types. High IQ scores were the criteria for inclusion in the Terman group. None of these received major literary prizes, differentiating the patterns related to intelligence from literary creativity.

The results may suggest genetic and environmental interactions. Both the preponderance of parental performance occupations and of unfulfilled wishes for creativity could point to a pattern of recessive inheritance or dominant transmission with environmental suppression. Performance or applied occupations of parents may involve skills similar to those manifested by creative offspring (that is, linguistic proficiency). Unfulfilled creative wishes could indicate unrealized creative potential. A complex pattern of inheritance involving generation skipping (that is, transmission from grandparents) may be involved. Because we could not consider data regarding occupations or creativity of grandparents in this study, further research with this focus is warranted. Also, like all previous studies on the topic, including Galton's (1), the current investigation is based on resemblance criteria similarities between parental and offspring behaviour. Corroboration by direct assessment of gene transmission is desirable.

Moreover, a complete study of genetic transmission of a factor requires both the analysis of how it is transmitted in all possible matings and the analysis of enough pedigrees to provide information on the mode of inheritance. There are difficulties also in the interpretation of pedigrees. Genes of low or incomplete penetrance do not express themselves in all persons that carry them. This may have occurred in both recessive and dominant states among the literary prizewinners and their parents. Gene expression also requires interaction with other genes. Both parents in performance occupations and those with unfulfilled creative wishes may, for example, need to transmit additional skills such as fluency or artistic temperament for the expression of successful literary creativity.

Other factors that might play a part in the constellations found here concern provisions of opportunities for success. Parents in performance occupations and those with unfulfilled creative wishes may have superior financial, social, and intellectual resources and be able and willing to provide educational advantages, work, and business connections. Beyond that, fluctuations in the cultural ethos throughout the 20th century

may have favoured writers with particular types of familial background experiences.

While not inconsistent with explanations based on both genetic and environmental factors, the constellations found here suggest particular developmental influences. Parents in performance occupations likely convey their skills and interests to their children over long periods of time. Unrealized parental goals, whether or not they derive from creative skills, exert a constant influence. Also, while parents and children of the same sex predominate in performance occupations and unfulfilled creative wishes, the parent of the opposite sex often shares or supports the same-sex parent's interests and wishes. Psychiatric and psychological descriptions of the family constellation and its effects from published biographic sources are necessarily limited. However, intensive and extensive psychiatric research interviews (9–11) carried out with more than 450 outstanding creative persons in literature, art, and science, including 61 Nobel laureates, indicate the importance of developmental factors.

The family background pattern of performance occupations and unfulfilled creative wishes has a salient effect on the motivation for literary creativity. Two predominant factors are likely involved. First, the offspring identifies with the goals and wishes of the parent of the same sex. An occupational field is chosen on the basis of similarity with that of the parent of the same sex, and creative success is a living out of that parent's conscious or unconscious wishes. When parents are in remote or nonperformance occupations, unfulfilled creative wishes may also provide a basis for identification. With this latter combination, the unfulfilled wishes may be deep and subtly pervasive, possibly providing an even stronger impetus toward adoption and identification by the offspring.

Second, intense competition develops, starting with the choice of a creative, socially more distinguished occupation and a wish to outdo the parent. Gratification of the parent of the opposite sex, who often shares interests and wishes related both to the occupational field and creative achievement, seems to be involved. There is, then, a many-faceted push toward creativity. Because of the child's concomitant competitive urge and identification with parental wishes, intense motivation develops early and continues throughout the creative person's life. High levels of motivation have been shown to be required for successful creativity (10,18,19).

The developmental influence of the family background pattern would also account, in part, for the affective and cognitive structure of creative processes. Creation in literature, or in any artistic or scientific field, involves production of the new (that is, a breaking away from its forebears) while concomitantly maintaining a connection. The content of a creation is connected with the past, and yet, it presents something

previously unheralded. Shakespeare's plays provide an example. They are all derived from known stories which he composed in new ways. The developmental influence of identification, together with competition, helps produce the creative person's orientation toward concomitant connection and breaking away. The family-background pattern is a basis for cognitive creative development. Its internal structure is associated with the formation of the cognitive modality known as homospatial process—actively conceiving 2 or more discrete entities occupying the same space, a conception leading to the articulation of new identities (9,20–22). In this creative process, discrete entities, such as visual, auditory, and kinesthetic images and representations, compete to occupy the same space, resulting in a new identity with distinct connections to its forebears. This process is responsible in literature for creating characters and metaphors, both specific metaphorical constructions in poetry and broader literary ones (for example, the metaphoric Hamlet, which characterizes a whole literary work). Literary characters are produced by the homospatial process through superimposition of known persons upon the author's self.

## Conclusions

Creative achievement is facilitated by a family background constellation involving the work and aspirations of the congruent-sex parent and the creative orientation of both parents. In psychiatric practice, these findings pertain to treatment of creative persons and to genetic counselling. There is no proven connection between creativity and psychopathology (23–25), but creative persons frequently and knowledgeably seek therapy for work blocks and the entire range of psychiatric disorders. In such treatments, it is important to be aware of factors specifically related to creativity rather than psychopathology. Direct inheritance of creativity should not be stressed. Factors such as strong motivation should be differentiated from aberrant processes and influences. The family background constellation, which instigates both identification and competition, appears to have developmentally productive effects.

Genetic counselling, both of creative patients and of their relatives, should include a description of the findings and examples of types of parental influence and should also recognize the probable importance of psychological nurturance. Parents may be guided to accept, and not discourage, intense motivations for creativity, as well as competitive strivings from their offspring. Those with unfulfilled creative wishes may, especially if they are in performance occupations, have such wishes fulfilled by their children.

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#### Résumé : Les antécédents familiaux et le génie

**Objectif :** La croyance selon laquelle le génie est inné et non acquis est très répandue parmi les professionnels et les profanes. Toutefois, les premières études statistiques toujours influentes de Frances Galton, sur l'hérédité du génie, n'ont été ni appuyées, ni réfutées. Cette étude évalue empiriquement l'hypothèse de la transmission héréditaire.

**Méthodes :** Nous avons recueilli les données des antécédents familiaux de 50 lauréats de prix Nobel en littérature, 31 récipiendaires du prix Booker, 135 gagnants du prix Pulitzer et 20 récipiendaires du National Book and National Book Critics Circle. Ces sujets ont été comparés quant à l'incidence de l'hérédité professionnelle (c'est-à-dire, la même profession parent-enfant) avec un groupe assorti de 392 personnes éminentes dans des professions non créatrices. En ce qui concerne le type de profession prédominant, les données des sujets ont été comparées avec les données de 560 personnes n'ayant pas gagné de prix mais ayant un QI élevé, de même qu'avec les données professionnelles de la population générale.

**Résultats :** L'incidence d'un ou des deux parents ayant la même profession n'était que de 1 % pour les lauréats littéraires, mais de 16 % pour les personnes éminentes non créatrices ( $P < 0,0001$ ). La constellation prédominante (76 %) des antécédents familiaux des lauréats consistait dans une congruence du sexe parent-enfant soit dans des professions appliquées équivalentes exigeant le langage, la persuasion ou des talents d'artisan ( $P < 0,0001$  comparativement aux sujets témoins), soit dans des professions non reliées avec des désirs non comblés d'expression créatrice.

**Conclusions :** Les lauréats littéraires exceptionnels ne manifestent pas d'hérédité directe de la créativité de leurs parents; plutôt, les parents et enfants de même sexe sont de façon prédominante dans des professions appliquées équivalentes ou de haut rendement avec des désirs non comblés d'expression créatrice. Nous suggérons qu'il y a des influences développementales précoces sur la motivation de l'enfant qui font appel à l'identification et à la compétition avec le parent de même sexe.