Versatility in Genius

A History of Historiometric Studies of Historic Creators

Five Empirical Studies 1936-2010

- Two studies partially based on Cox (1926)
  - White (1936)
  - Simonton (1976)
- Sulloway (1996)
- Two Cassandro studies:
  - Cassandro (1998)
  - Cassandro & Simonton (2010)

Basic Definitions

- Versatility
  - Interests and abilities in more than one domain or subdomain
    - Where a domain is like science, literature, philosophy, etc.
    - And where a subdomain is like poetry, drama, and fiction within literature
  - Presumably interests are prior to and hence lower than abilities
  - Moreover, both interests and abilities admit of degrees
- Polymathy
  - Achieved eminence in more than one domain or subdomain,
    - Where the former indicates greater polymathy than the latter
      - e.g., Shakespeare was “only” a poet and dramatist
    - Yet achieved eminence also admits of degrees
      - e.g., Goethe’s literary achievements surpass his scientific achievements

Two studies partially based on Cox (1926)

- Cox's (1926): *Early Mental Traits of Three Hundred Geniuses*
  - Volume 2 of Terman's (1925-1959) *Genetic Studies of Genius*
  - *N* = 301: the most eminent creators and leaders of Western history born between 1450 and 1850 (based on Cattell, 1904)
  - Ranked eminence scores also based on Cattell (1904)
  - Multiple raters estimated IQ scores (early and late; raw and corrected)
  - Raw biographical data deposited as typescript in Stanford's Terman Archives
  - Data abstracts included in Cox's 842-page tome (aka her doctoral dissertation)

Two studies partially based on Cox (1926)

- White (1931): “The Versatility of Genius” (*JSP*)
  - “The study was initiated by Dr. Lewis M. Terman, and carried out under his direction” (White a 24 year-old Stanford graduate student)
  - Consulted “Dr. Catherine Cox Miles” (who had married a Stanford professor)
  - Yet *N* = 300 [sic]: Assessed on 23 different fields (excluding field of eminence)
  - Used an ordinal scale from -5 to +5 with 0 = “average college student”
  - Positive scores far more common than negative scores (i.e., more versatile)
  - Ability items more common than interest items (former 3/4ths of total)
  - Soldiers, artists, and musicians significantly lower than other geniuses
  - Four clusters: scientific, literary, scholastic, and administrative
    - e.g. literary = poetry, novels, and drama

Most Versatile Cases

Goethe

Main field of eminence: poetry. Positive scores: drama 5, novels 5, philosophy 4.5, conversation 4.5, science 4, languages 4, non-fictional prose 4, administration 3.5, art 3.5, history 3, medicine 3, handwork 3, politics 2.5, humor 2.5, law 2, social theory 2, music 1, invention 0.5. Positive scores: 18. Negative scores: none. Total points: 58.5.[4]

Franklin

Main field of eminence: politics (including diplomacy). Positive scores: science 5, non-fictional prose 5, humor 5, conversation 5, business 4.5, administration 4.5, philosophy 4, social theory 4, invention 4, handwork 3, poetry 2, public speaking 1, drama 1. Positive scores: 13. Negative: none. Total points: 48.

Two studies partially based on Cox (1926)

- Simonton (1976): “Biographical Determinants of Achieved Eminence: A Multivariate Approach to the Cox Data (*JPSP*)
  - Besides using her eminence and IQ scores, created new measures of father’s status, formal education, and versatility
  - The last defined as follows: (a) 1 point for achievement in each of the 10 major domains in addition to the principal domains of eminence and (b) .5 point for each extra accomplishment within the major domain of eminence
  - e.g. Michelangelo was a sculptor, painter, architect, and poet
    - Hence 1 point for being an imaginative writer in addition to his primary work as an artist
    - and .5 point for being a painter and another .5 point for being an architect in addition to his work as a sculptor (his principal achievement within art),
    - yielding a total versatility score of 2

Two studies partially based on Cox (1926)

- Simonton (1976): continued
  - N.B.: The resulting versatility score is actually a polymathy score
  - Significantly, $M = .61$ ($SD = .76$), indicating a fairly large amount of versatility
  - Moreover, versatility correlates positively with
    - ranked eminence ($r = .23$, $p < .01$)
    - estimated IQ ($rs = .29$-$.30$, $p < .01$)
    - formal education ($r = .14$, $p < .01$)
  - However, the relation between versatility and ranked eminence was only strong for the 109 leaders, not for the 192 creators
  - Unfortunately, without breaking these two categories down further, it's hard to specify why

Sulloway (1996)

- *Born to Rebel:* p. 481, note 93
  - 15-item scientific eminence measure (N = 2,259, alpha = .94)
    - r = .24 (p < .0001) with “number of fields in which a scientist made significant contributions”
    - “Conditioned on this linear trend, there is also a significant quadratic trend” (r = .06, p < .005)
    - “Eminence was achieved most *efficaciously* by specialization or be extreme diversification”
    - “In the middle of the distribution, people received relatively less distinction for their efforts at diversification”
  - Hence, the relation between within-science versatility (polymathy) and eminence is best described by a J-curve
  - e.g., Galileo, Kepler, Descartes, and Newton illustrate the high point of that curve

Two Cassandro studies

- First, Cassandro (1998): “Explaining Premature Mortality across Fields of Creative Endeavor” (*JoP*)
  - *N* = 2,102 historical creators (biographical entries in *Encyclopaedia Britannica*)
  - Represent seven distinct domains: technology, science, philosophy, literature, music composition, visual arts, and performance
  - Born between 620 BCE and CE 1800 (with reliable birth and death data)
  - Classified into nonversatile, intrafield versatile, and interfiled versatile
    - 61% nonversatile
    - 15% intrafield versatile
    - 24% interfield versatile
  - Because versatility is defined as in polymathy, these percentages actually indicate the latter

Two Cassandro studies

- Cassandro & Simonton (2010): “Versatility, Openness to Experience, and Topical Diversity in Creative Products: An Exploratory Historiometric Analysis of Scientists, Philosophers, and Writers” (*JCB*)
  - First author’s doctoral dissertation, under the second author’s supervision and later writing up for publication
  - *N* = 67 creators who sole-authored at least one work included in *Great Books of the Western World* (flourished 500 BCE - 1940 CE): philosophers (35.8%), scientists (28.4%), creative writers (26.9%), and scholars (9.0%)
  - *n* = 38 subsample with 2 recent biographies with sufficient information to obtain reliable observer-based ratings on openness to experience (flourished 1265 – 1896): philosophers (44.7%), creative writers (28.9%), scientists (21.1%), and scholars (5.3%)

Two Cassandro studies

- Cassandro & Simonton (2010): continued
  - *Versatility* assessed via a 10-point scale
    - 1 point for each of 5 potential ability clusters defined by White (1931);
    - 1 point for each of intelligences defined by Gardner (1993);
    - 1 point for each vocational type distinguished by Holland (1985);
    - 1 point for each major domain of contribution 0.5 points each additional subfield of contribution as defined by Simonton (1976); and
    - 1 point maximum for versatility within a domain and 1 point maximum for versatility across domains as defined by Cassandro (1998)
    - each assessed two different ways: exclusive (i.e., ascriptive identifiers only; polymathy) and the other inclusive (i.e., any information available in biographical entries; versatility)
    - Averaged into a 10-item composite with alpha reliability of .91 (M = 1.83)
    - Also a second version corrected for life span and birth year

Two Cassandro studies

- Cassandro & Simonton (2010): continued
  - *Openness to experience* 2 raters using observer-based version of NEO-PI-R (Costa & McCrae, 1992):
    - but alpha = .47 (cf. .78-.92 for other Big Five);
    - also narrowest range and *SD*, suggesting a not surprising ceiling effect
  - *Topical diversity* assessed using the *Great Books Syntopicon* which analyzes the anthology's contents according to 102 major themes in the intellectual history of Western civilization
    - *Average topical diversity* (*M* = 56.39, *SD* = 25.03)
    - *Maximum topical diversity* (*M* = 63.82, *SD* = 24.89)
    - Also a second pair corrected for number of pages

TABLE 1. Correlations for versatility, topical diversity, and openness to experience.

Variable	Topical diversity				Versatility	
	Composite		Corrected			
	Ave.	Max.	Ave.	Max.	Composite	Corrected
Versatility						
Composite	.36	.44	.33	.42	—	—
Corrected	.22	.33	.22	.33	.90	—
Openness	.30	.25	.38	.27	.05	.01

Note. The correlations in the first two rows do not involve Openness and thus were calculated using the entire sample ($N = 67$). The remaining correlations were calculated using the personality subsample ($n = 38$).

Conclusions

- Using historiometric methods, both versatility and polymathy can be assessed in creative geniuses of the highest order
- These assessments feature relationships with other individual differences, including achieved eminence, estimated IQ, formal education, topical diversity, and primary domain of achievement