Scientific Giftedness: Exploring the creativity correlates

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Abstract

Giftedness is a psychological phenomenon which refers to the power of the mind which actualizes in rare and precious performances of humankind. When exhibited in the scientific domain it has fundamentally altered the course of millions of lives. Unravelling the mysteries of scientific giftedness has been the purpose of research for centuries. Current traditions in psychology regarding the study of genius validate IQ as an appropriate indicator of giftedness with rich production in specific domains. The sample for the present study comprised of gifted youth from the science stream (IQ 115 and above) and non-gifted (IQ 95-110) who were also from the same stream. Affinities of personality in the gifted and non-gifted were assessed along with creativity. The tests used in the study were Culture Fair Test (Scale 2, R. B. Cattell and A. K. S. Cattell, 1961), Torrance test of Creative Thinking (Figural forms, Torrance. E. Paul, 1974), NEO Personality Inventory (NEO PI-R, Costa & McCrae, 1992). The findings of the study present highly differentiated patterns of correlations between personality dimensions and creativity for the scientifically gifted and non-gifted which has significant implications for the unraveling of the dynamics of creativity.

Keywords: Scientific Giftedness, Creativity, Personality, Critical thinking.

References

- Barron, F. B., & Harrington, D. M. (1981). Creativity, intelligence, and personality. In M. R. Rosenzweig & L.W. Porter (Eds.), *Annual Review of Psychology, 32*, 439-476. Palo Alto, CA: Annual Reviews.
- Batey, M., & Furnham, A. (2006). Creativity, intelligence and personality: A critical review of the scattered literature. Genetic, General and Social Psychology Monographs, 132, 355–429.
- Butcher, H.J. (1968). Human Intelligence: Its nature and assessment. London, Methuen.
- Cashdan, S., & Welsh, G. D. (1966). Personality correlates of creative potential talented high school students. *Journal of Personality*, 34, 445-455
- Cattell, R.B. and Cattell, A.K.S. (1963). Test of "g": Culture Fair (Scale3, Form A, 1963 Edition, Form B, 1961 Edition, Second) Champaign, IL: Institute for personality and ability testing.
- Costa PT Jr., Terracciano A, & McCrae RR (2001). Gender differences in personality traits across cultures: Robust and surprising findings. *Journal of Personality and Social Psychology*, 81, 322-331.
- Costa, P. T., McCrae, R. R., & Dye, D. A. (1991). Facet scales of agreeableness and conscientiousness: A revision of the NEO personality inventory. *Personality and Individual Differences*, 12, 887-898.
- Costa, P., McCrae, R., & Holland, J. (1984). Personality and vocational interest in an adult sample. *Journal of Applied Psychology*, 69, 390-400.
- Costa, P.T., Jr., & McCrae, R.R. (1992). Normal personality assessment in clinical practice: The NEO-Personality Inventory. Psychological Assessment, 4, 5-13, 20-22. Damasio, A.R. (1994). Descartes' error: Emotion, reason and the human brain. New York: Putnam.
- Digman, J., & Takemoto-Chock. (1981). Factors in the natural language of personality: Reanalysis, comparison, and interpretation of six major studies. *Multivariate Behavioral Research*, 16, 1246–1256.
- Dunbar, K. (1995). How scientists really reason: Scientific reasoning in real-world laboratories. In R. J. Sternberg & J. E. Davidson (Eds.). *The nature of insight* (pp. 365–395). Cambridge, MA: The MIT Press.
- Eiduson, B.T. (1958). "Artist and non-artist: a comparative study", Journal of Personality, 26, 13-28.
- Ericsson, K., & Lehman, A.C. (1996). Expert and exceptional performance: Evidence of maximal adaptation to task constraints. *Annual Review of Psychology*, 47, 273-305. doi: 10.1146/annurev.psych.47.1.273.
- Eysenck, S.B.G., Eysenck, H.J., & Barrett, P. (1985). A revised version of the psychoticism scale. *Personality and Individual Differences*, 6, 21-29.
- Eysenck, M. W. & Graydon, J. (1989). Susceptibility to distraction as a function of personality. Personality and Individual Differences, 10, 681–687.
- Feist, G. J., & Barron, F. X. (2003). Predicting creativity from early to late adulthood: Intellect, potential and personality. *Journal of Research in Personality*, 37, 62–88.
- Feist, G. J. (1998). A meta-analysis of the impact of personality on scientific and artistic creativity. Personality and Social Psychological Review, 2, 290-309.
- Feldhusen, J. F., & Treffinger, D. J. (1986). Creative thinking and problem solving in gifted education. Debuque, IO: Kendall/Hunt.
- Flescher, I. (1963). Anxiety and achievement of intellectually gifted and creatively gifted children. *Journal of Psychology: Interdisciplinary and Applied*, 56 (2), 251-268.
- Garwood. D.S. (1964). Personality factors related to creativity in young scientists. *Journal of Abnormal and Social Psychology*. 68, 413-419.
- Gotz, K.O., & Gotz, K. (1979). Personality characteristics of successful artists. Perceptual and Motor Skills, 49, 919-924.
- Gough, Harrison G. (1957). California Psychological Inventory: Manual. Palo Alto, Calif.: Consulting Psychologists Press.
- Gross, M.U.M. (2000). Issues in the cognitive development of exceptionally and profoundly gifted individuals. In K.A. Heller, F.J. Monks, R.J. Sternberg, & R.F. Subotnik (Eds.). *International handbook of research and development of giftedness and talent (second edition)*. NewYork: Pergamon.
- Guilford, J. P. (1962). Creativity: Its measurement and development. In J. J. Parnes and H. F. Harding (Eds.). *A source book for creative thinking*. New York: Scribners.
- Guilford, J. P. (1960). Basic conceptual problems of the psychology of thinking. *Proceedings of the New York Academy of Sciences*, 91, 6–21.
- Heller, K.A. (1989). Perspective on the diagnosis of giftedness. German Journal of Psychology, 13, 140-159.
- Helson, R. (1967). Personality characteristics and developmental history of creative college women. *Genetic Psychology Monographs*, 76, 205-256.
- Hsen-Hsing, M. (2006). A synthetic analysis of the effectiveness of single components and packages in creativity training programs. *Creativity Research Journal*, 18(4), 435-446.

- Jensen, A. R. (1993). Test validity: g versus "tacit knowledge". Current Directions in Psychological Science, 1, 9-10.
- Johnson, J. A., Germer, C. K., Efran, J. S., and Overton, W. F. (1988). Personality as the basis for theoretical predilections, *Journal of Personality and Social Psychology*, 55(5), 824-835.
- Langer, E. (1989). Mindfulness. Reading, MA: Addison-Wesley.
- MacKinnon, D.W. (1963a). Identifying and developing creativity. *Journal of Secondary Education*, 38, 166-174
- Marland, S.P. (1972). Education of the gifted and talented: Report to the Congress of the United States by the U.S. Commissioner of education. Washington, D.C.: U.S. Government Printing Office.
- Martindale, C., Daily, A. (1996). Creativity, primary process cognition and personality. *Personality and individual differences*, 20 (4), 409-414.
- McCluskey, K. W. (2010). Comments on Ghassib's "where does creativity fit into a productivist industrial model of knowledge production?" *Gifted and Talented International*, 25(1), 23-26.
- Mednick, S. A. (1962). The associative basis of the creative process. Psychological Review, 69(3), 220-232.
- Renzulli, J.S. (1978). What makes giftedness? Re-examining a definition. *Phi Delta Kappan*, 60, 180-184, 261.
- Renzulli, J.S. (2005). The three-ring definition of giftedness: A developmental model for promoting creative productivity. In R.J. Sternberg & J.E. Davidson (Eds.), *Conceptions of giftedness* (2nd ed., pp. 246-280). New York: Cambridge University Press.
- Rieger, M. P., & Blaubergs, M. S. (1979). Creative Women: Their Potential, Personality and Productivity. *Journal of Canadian Woman Studies*, 1 (3).
- Roeper, A. (1991). Gifted adults: Their characteristics and emotions. Advanced Development, 3, 85-98.
- Roth, W. M., & Lee, S. (2008). Science education as/for participation in the community. *Science Education*, 88(2), 263-291.
- Simonton, Dean K. (2000). Creativity: Cognitive, Personal, Developmental, and Social Aspects. American Psychologist 55(1):151-158.Stein, M. I. (1974). Stimulating Creativity, Vol. 1. New York: Academic Press
- Sternberg, R. J. (2005). The WICS model of giftedness. In R. J. Sternberg & J. E. Davidson (Eds.), Conceptions of giftedness, (2nd ed., 327-243), New York: Cambridge University Press.
- Tannenbaum, A. J. (2000). Giftedness: The ultimate instrument for good and evil. In K. A. Heller, F. J. Monks, R. J. Sternberg, & R. F. Subotnik (Eds.), *International handbook of giftedness and talent* (2nd ed.). New York: Elsevier.
- Tannenbaum, A.J. (1986). Giftedness: A psychosocial approach. In R.J. Sternberg & J.E. Davidson (Eds.), *Conceptions of Giftedness*. (pp. 21-52). New York: Cambridge University Press.
- Tomlinson- Keasey, C. & Keasay, C. B. (1993). Graduating from college in the 1930s: The Terman Genetic Studies of Genius. In K.D. Hulbert & D.T. Schuster (Eds.). Women's Lives Through Time: Educated American Women of the Twentieth Century (pp. 63-92). San Francisco, CA: Jossey-Bass.
- Torrance, E. P. (1974). The Torrance Tests of Creative Thinking-Norms-Technical Manual Research Edition-Verbal Tests, Forms A and B- Figural Tests, Forms A and B. Princeton, NJ: Personnel Press.
- Treffinger, D., Young, G., Selby, E., & Shepardson C. (2002). Assessing creativity: A guide for educators. Storrs, CT: The National Research Centre on the Gifted and Talented.
- Trilling, L. (1955). Freud and the crisis of our culture. Boston: Beacon Press.
- Watson, D., & Clark, L. A. (1984). Negative affectivity: The disposition to experience negative aversive emotional states. Psychological Bulletin, 96, 465–490.
- Wendy, L. (2007). NEO PI-R A Guide to Interpretation and Feedback in a Work Context. Hogrefe Ltd, Oxford.
- Wolfradt, U., & Pretz, J. (2001). Individual differences in creativity: Personality, story writing, and hobbies. European Journal of Personality, 15, 297–310.
- Yu, M. (1977). *Personality Profile and life situation of creative female professionals*. Paper presented at the thirty-eighth annual convention of the Canadian Psychological Association, Vancouver, B.C.
- Zenasni, F., et Mouchiroud C. (2005). Aspects socio-émotionnels du phénomène du haut potentiel. In T. Lubart (Ed.). *Enfants exceptionnels : Précocité intellectuelle, haut potentiel et talent* (pp 142-156). Bréal: Paris.