

The Nature and Nurture of Creative Talent

Donald W. MacKinnon

Page 484

- Dr. Bingham was one of the first to insist that it is not enough to recognize creative talent after it has come to expression
- It is through our insights or through the use of validated predictors to discover talent when it is still potential → provide social climate and intellectual environment, which will facilitate its development and expression
- Study done at the university of California and supported by the Carnegie Corporation of New York
- First task - decide what would be considered creativity (484-485)

Page 485

- Necessary because creativity has been described in a number of different ways
- 2nd: need to know how to define creativity so as to figure out the kinds of persons they want to study
- True creativeness Fulfills at least three conditions: response or an idea that is novel or at the very least statistically infrequent
- Something that is creative → must to some extent be adaptive to, or of, reality
- Must serve to solve some sort of problem, fit a situation or accomplish some recognizable goal
- Third: true creativeness involves a sustaining of the original insight, an evaluation and elaboration of it, a developing of it to the full
- **Creativity: originality, adaptiveness, and realization**
- May be brief or may require a number of years
- For their research → not seek to study creativity while it was still potential but only after it had been realized and had found expression that was clearly identifiable creative products ie buildings that have been designed by architects, mathematical proofs developed by mathematicians etc
- Idea of creativity forced them to reject indicators or criteria of creativeness the performance of individuals on so called tests of creativity
- These test require the subject think for example some unusual uses for common objects → consequences of unusual events, may measure the infrequency or originality of a subject's ideas in response to specific test items → **fail to reveal the extent to which the subject is faced with real life problems is likely to come up with solutions that are novel and adaptive and which they will be motivated to apply in all of their ramifications**
- Limit their research to persons who had demonstrated a high level of creative work → still had to figure out which creative fields they were seeking to recruit their subjects → ended up being: creative writing, architecture, math, industrial research, physical science, and engineering (artistic and scientific creativity)
- **Artistic creativity - products of the creators inner states, needs, perceptions, motivations (externalization of something from the artist into the public field)**

- “Scientific creativity, the creative product is unrelated to the creator as a person, who in his creative work, acts largely as a mediator between externally defined needs and goals”
- In this part of the study - operates on some aspect of his environment → produce a novel and appropriate product
- Domains where one must be an artist and scientist represented with mathematicians and architects
- Mathematicians - connected to science but express themselves as artists (personal product/external problem)

Page 486

- Architects - both artist and scientist
- Architecture designs must fulfill three demands: “Delight”, “Firmness”, and “Commodity” → not limited to these demands
- Successful and effective architect must with the skill of a juggler, combine, reconcile, and exercise the diverse skills of businessman, lawyer, artist, engineer, and advertising man, as well as those of author and Journalist, psychiatrist, educator, and psychologist
- It should be clear - any attempt to discover the distinguishing traits of creative persons can succeed only in so far as some group of qualified experts can agree upon who are the more and who are the less creative workers in a given field of endeavor
- Asked five pros of architecture, each working independently to nominate the 40 most creative architects in the United States → supplied them with 86 names instead
- 13 of the 86 architects were nominated by all five panel members, and 9 nominated by four 11 by three and 13 by two, 40 were individual nominations each proposed by a single panel member
- 11 editors of the major American architectural journals, Architectural Forum, Architectural Record, the Journal of the American Institute of Architects, and Progressive Architecture, to rate the creativity of the 64 of the nominated architects who they invited to participate in the study
- Later asked the 40 nominated architects who accepted to rate the creativity of the editors’ ratings of the creativity of the architects correlated $+0.88$ with the architects’ own ratings, it is clear that under certain conditions and for certain groups it is possible to obtain remarkable agreement about the relative creativeness of individual members of a profession and thus meet the first requirement for an effective study of creative persons
- Second requirement for the successful establishment of the traits of creative individuals is their willingness to make themselves available for study
- Hopes was to win the cooperation of each person who they invited to participate in the research
- To obtain 40 acceptances 64 invitations had to be sent out
- Came to Berkeley for a weekend of intensive study in the Institute of Personality Assessment and Research
- Groups of 10 - studied by the variety of means which constitute the assessment method - problem solving experiments → tests to reveal what a person does not know or is unable to reveal about himself

- The response of creative persons to the invitation to reveal themselves under such trying circumstances has varied
- Those who have been angry at those who have attempted to study something as mysterious as creativity
- On the other hand there were those who were replied very courteously and warm heartedly/welcoming and even eagerness to contribute a better understanding of the creative person and the creative process
- Those who are willing to be assessed different in important ways willing to be assessed different in important ways from those who refuse
- Psychological traits - we can never know
- Diff between the 40 who accepted and the 24 who declined = know that the two groups are indistinguishable
- When the nominations of the panels ratings were converted to standard scores and the means for 24 vs. 30 were compared they were found to be identical
- When the editors ratings were converted to the mean for the non assessed group was slightly higher (51.9) than for the non assessed sample (48.7) but the difference is not statistically significant (486-487)

Page 487

- Third requirement: is that the profession be widely sample beyond those that have been nominated as highly creative, as the distinguishing characteristics of the restricted sample might not have anything to do with their creativeness
- Instead they might be traits that are characteristic of all members of the profession, whether they be creative or not → distinguishing the professional group as a whole, but in no sense is limited or peculiar to its highly creative members
- Architects, two additional samples were recruited for study → both of which ended up matching the highly creative sample, in terms of the age and geographic location of practice
- The first supplementary sample had at least two years of experience and association with one of the originally nominated creative architects → the second added sample was composed of architects who had never worked with any of those nominated creatives
- In selecting three samples in this manner - hoped to tap into a range of talent which was sufficiently wide to be fairly representative of the profession as a whole → appeared to have succeeded
- Mean rating for each of these groups - ratings having been made on a nine point scale by six different groups of architects and experts related to architecture
- Architects I 5.46 for Architects II, 4.25 and for Architects III 3.54 → differences in mean ratings between each group being statistically highly significant
- Persons who are said to be highly creative are believed to have a good opinion of themselves, which is evidenced in the adjectives that they use to describe themselves (represents the basic acceptance of self)
- This allows them to speak more frankly as well as more critically about themselves
- The self image of the more creative differ from the self images of the less creative
- Architect I in comparison to Architect II describe themselves as inventive, determined, independent, individualistic, enthusiastic, and industrious

- Architects I and II described themselves as responsible, sincere, reliable, dependable, clear thinking, tolerant and understanding
- "...Where creative architects more often stress their inventiveness, independence, and individuality, their enthusiasm, determination and industry, less creative members of the profession are impressed by their virtue and good character and by their rationality and sympathetic concern for others"
- Discrepancies between their descriptions of themselves as they are and as they would ideally be are remarkably alike for all architects regardless of their level of creativeness
- All three of the groups revealed that they desire more personal attractiveness, self confidence, maturity and intellectual competency, a higher level of energy and better social relations
- Differences show that Architects I would be ideally be more sensitive, while both Architects II and III wish for the opposite → ideally be more original/self controlled and disciplined
- Relation between intelligence and creativity → low positive correlation between intelligence and the level of creativeness - essentially zero relationship between the two variables

Page 488

- Over the whole range of intelligence/creativity there is a positive relationship between the two variables
- "...being more intelligent does not guarantee a corresponding increase in creativeness. It just is not true that the more intelligent person is necessarily the more creative one." (484)
- Looking into the psychological health of the subjects ie the association of genius with insanity
- Look at their profiles on the Minnesota Multiphasic Personality Inventory (MMPI) → test developed to measure tendencies toward the psychiatric disturbances that man is heir to: depression, hysteria, paranoia, schizophrenia and the like
- Eight scales - measure the strength of the disposition of the persons → earned score which on average are some 5 to 10 points above the general population's average score of 50
- Elevated scores of this degree on these scale - do not have the same meaning for the personality functioning of persons who, like the subjects - getting along well in their personal lives and professional careers that they have for hospitalized persons
- Manner which creative persons describe themselves on this test as well as in the life history psychiatric interview is less suggestive of psychopathology than it is of good intellect, complexity and richness of personality - lack of defensiveness and candor in self-description → in other words to experience one's inner self
- Most striking of MMPI → all male subjects - extremely high peak on the MF (femininity) scale
- This is also demonstrated on the Fe (femininity) scale of the California Psychological Inventory (CPI) and on the masculinity-femininity scale of the Strong Vocational Interest Blank
- Scores that indicate more masculinity correlate with rated creativity

- More creative a person is, the more they reveal an openness to his own feelings and emotions, a sensitive intellect and understanding self-awareness, and a wide range of interests, including many which are thought to be feminine
- Swiss Psychologist Carl G. Jung (1956) → creative persons are not completely identified with their masculine persona roles as to blind themselves or deny expression to more feminine traits of the anima
- For some, the balance between masculine and feminine traits → precarious
- Several subjects - their presently achieved reconciliation of these opposites on their nature has been barely affected and only after considerable psychic stress and turmoil
- Perceptiveness of the creative and his openness to richness and complexity of experience is revealed on the Barron- Welsh Art Scale Preference Test
- Presents to the subject a set of 62 abstract line drawings which range from simple and asymmetrical ones
- In the original study which standardized this scale, some 8- painters from New York, San Francisco, New Orleans, Chicago and Minneapolis showed a marked preference for the complex and asymmetrical - vital dynamic figures
- Contrasting sample of nonartists revealed a marked preference for the simple and symmetrical drawings
- All creative groups - studied have shown a clear preference for the complex and asymmetrical, and in general the more creative a person the stronger that preference
- The preference for perceptual complexity - significantly correlated with creativity

Page 489

- Given the chance within a 30 minute period to create a 8"X10" colored mosaic
- Some subjects used the fewest colors as possible while others used as many as possible (22 colors available)
- In ref to architects, there is a significant though low positive correlation of +.38 between the numbers of colors a subject chooses and his creativity as rated by experts
- Clear that creative persons are especially disposed to admit complexity and even disorder into their perceptions without being made anxious by the resulting chaos
- Not so much that they like disorder by that they prefer the richness found within the disordered as compared to the stark barrenness of the simple
- They appear to be challenged by disordered multiplicity which arouses in them a strong need which in them is serviced by a superior capacity to achieve the most difficult and far reaching - ordering of the richness they are willing to experience
- Creative person's openness to experience is further revealed on the Meyers-Briggs Type Indicator
- "...one might say that whenever a person uses his mind for any purpose, he performs either an act of perception (he becomes aware of something) or an act of judgment (he comes to a conclusion about something)." (489)
- Show consistent preference for one or the other of these - either to perceive or to judge
- Habitual pref for the judging attitude may lead to some prejudging and at the very least to the living of a life that is orderly and controlled → carefully planned
- More perceptive attitude - results in a life that is more open to experience both from within or from without, and characterized by flexibility and spontaneity

- Judging - places more emphasis upon the control/regulation of experience, while a perceptive type can be deemed as more open/receptive to all experience
- Majority of creative writers, mathematicians et are perceptive types
- Among research scientists - found the majority to be judging types
- Also found within this group that there is a positive correlation between scientists and their preference and creativity as a scientific researcher
- Architects - preference for perception correlates +.41 with creativity
- Second preference as measured by the type indicator is the two types of perception: sense perception or sensation, which is a direct becoming aware of things by way of the senses vs. intuitive perception of the deeper meanings/possibilities found to be inherent in most things
- US - found that 3 out of 4 persons show a preference for intuitive perception
- US - 3 out of 4 found a preference for sense perception - concentrating on the immediate sensory experience/centering their attention upon existing facts
- One out of every four who shows a preference for intuitive perception - looks expectantly for a bridge or link between that which is given an present ant that which is not yet thought of, focusing habitually upon possibilities
- 90% of creative writers, 92% of mathematicians, 93% of the research scientists and 100% of the architects are intuitive as measured by this test
- One makes use of thought or of feeling; thinking being a logical process amongst an impersonal fact weighing analysis, while feeling is a process of appreciation and evaluation of things that gives them a personal and subjective value
- A preference for thinking or feeling appears to be less related to one's creativity as such than to the type of materials or concepts which are dealt with
- Writers prefer feeling, mathematicians, research scientists, and engineers prefer thinking, and architects are split 50/50 in their preference for the other two functions (489-90)

Page 490

- Final preference - introversion and extraversion
- Approx 2/3s of all the creative groups scored as introverts - no evidence that introverts are more creative than extraverts
- One would expect the highly creative to be different than those who are less creative - clear evidence that they are
- Strong Vocational Interest Blank - measures the similarity of a person's expressed interest with the known interests of individuals successful in a number of occupations + professions, all the creative subjects were shown to have only a slight variation from group to group
- Creative persons are relatively uninterested in small details, or in facts for their own sake → they are more concerned with meanings or implications possessed of considerable cognitive flexibility, verbally skillful, interested in communicating with others and accurate in so doing, intellectually curious, and relatively uninterested in policing either their own impulses and images or those of others
- Allport Vernon-Lindzey Study of Values (1951) - test designed to measure in the individual strength values of men as they have been described by German psychologist

and educator, Eduard Spranger (1928) - theoretical, economic, esthetic, social, political, and religious values → all the creative groups have as their highest values the theoretical and esthetic

- There is some incompatibility and conflict between the theoretical value with its cognitive and rational concern with truth and esthetic value with its emotional concern with form and beauty → appear that the creative person has the capacity to tolerate the tension that strong opposing values create in him, and in his creative striving he effects some reconciliation for them
- Creative person - demand that the problems be solved with an elegant solution → seeking both truth and beauty
- Qualities which describe the creative person: dominant, achievement of social status, poised, spontaneous, and self confident in personal and social interaction, not particularly sociable or participative, intelligent, outspoken, sharp-witted, demanding, aggressive, and self centered
- Persuasive, verbally fluent, self confident, self assured, relatively uninhibited in expressing his worries and complaints
- Free from conventional restraints/inhibitions, not preoccupied with the impression which they make on others
- Capable of great independence and autonomy, and relatively ready to recognize and admit self-views that are unusual and unconventional
- Strongly motivated to achieve in situations in which independence in thought and action are called for
- Less inclined to strive for achievement in settings where conforming behavior is expected or required
- In efficiency, steadiness of intellectual effort, does not differ from others
- More psychologically minded/more flexible - possessed of more femininity of interests

Page 491

- Word association test that were administered to the test subjects - found an unusualness of mental associations one of the best predictors of creativity
- Certain hazards when attempting to study a creative
- Most students with creative potential have personality structures congruent with, though possibly less sharply delineated than, those of mature creatives
- Been told the sources which fostered their creativeness, these are self reports and are subjects to misperceptions and self deceptions of all self reports
- Even if they were to assume that all their reports were essentially accurate, they would still have no assurance that the conditions in the home, school, society, the qualities of interpersonal relations between instructor and student, and the aspects of the teaching-learning process which would appear to have contributed to creative development, generation ago would facilitate rather than inhibit creativity if these same factors were created in today's quite different world and far different educational climate
- subjects have fostered their creative potential and independent spirit
- Find in their histories a number of circumstances that in their early years could have potentially provided them with an opportunity as well as the necessity for developing the

secure sense of personal autonomy and zestful commitment to their profession which characterizes them

- What most often have characterized these persons through their parents, was their respect for their child and their confidence in their ability to do what was appropriate → granting them freedom to explore their universe/make decisions for themselves
- Expectation that the child would act independently but reasonably/responsibly seems to have contributed significantly to their sense of autonomy, developing to such a marked degree
- Opposite side of this was that there was often a lack of closeness with one or both parents → typically the father, but often characterized the relationship with both parents
- Not strong emotional ties of either a positive or negative nature between parent and child but neither was a type of relationship that fosters over dependence or results in severe rejection (491-92)

Page 492

- Certain distance between child/parent - it had a liberating effect so far as the child was concerned
- Lack of emotional closeness - spared from exploitation
- Ambiguities in identification with parents → distance with parents - tendency with architects to identify with either both parents or neither
- Larger familial sphere presented the child with a plentiful supply of diverse and effective models - along with mothers/father, grandfathers, uncles - others who occupied prominent and responsible positions within their community - with whom identifications could be made
- Distant or present emotional interaction between father/son - presented a model of effective/resourceful behavior within an exceptionally demanding career
- More significant - high incidence of distinctly autonomous mothers among families of the creative architects, who led active lives with interests and sometimes careers of their own apart from their husbands
- Other factors involved in marked personal autonomy - discipline and religious training which they received → suggest that within their family, existed clear standards of conduct and ideas to what was right and wrong, but at the same time an expectation if not requirement of active exploration and internalization of a framework of personal conduct
- → discipline was consistent and predictable → rules/family standards + parental injunctions that were known and seldom infringed upon
- In nearly half the cases, corporal punishment was not employed and in only a few instances was the punishment harsh or cruel
- Religious practices - diverse, but what was emphasized was the development of personal ethic codes rather than religious practices (formal)
- 1/3 of families formal religion was important for one parent or for both - 2/3 formal religion was either unimportant or practiced only perfunctorily
- Majority placed emphasis on one's ethical code
- Values often related to integrity, intellectual and cultural endeavor, success and ambition, and being respectable and doing the right thing

- Families of more creative architects tended to move more frequently → given much more freedom to roam and explore, providing an enrichment of both cultural and personal experience, which their less creative peers did not have
- Frequent moving has also resulted in some estrangement from family/immediate neighborhood
- Reported that their family differed in behavior and values from those in the neighborhood - show greater cultural, artistic, and intellectual interests and pursuits
- Contributed to experiences of aloneness, shyness, isolation, and solitariness → to what extent this stemmed from a natural introversion interests and unusual sensitivity - unknown
- At a very early age developed an interest and skill in drawing and painting → almost no exception, one or both of the parents were of artistic temperament and considerable skill (9-10)

Page 493

- Often it was the mother who fostered their artistic potential through example and instruction
- These skills were both encouraged as well as able to develop at their own pace
- Lack of pressure from parents toward a particular career
- Nature of creative talent through nurturing it - in school/college through the processes of education
- Overestimated in our educational system the role of intelligence in creative achievement
- Ask a child to respond and believe that they will not respond creatively (let that be known) the likelihood of them responding creatively will become reduced
- When they are older - possibility that this creativity will be removed this process completely (learning)
- Selecting students for training - may have outweighed the role of intelligence either by setting the cutting point for selection on the intellectual dimension too high or by assuming that regardless of other factors the student with the higher IQ is more promising and should be chosen
- Data suggests, that if a person is of a minimum intelligence required for mastery of a field of knowledge, whether he performs creatively or banally in that field will be crucially determined by non intellectual factors
- Pay more attention in the future than in the past to the nurturing of non intellectual traits which have been shown to be intimately associated with creative talent
- Openness of the creative person to experience both from within and from without
- Discipline and self control are necessary - must be learned if one is ever to be truly creative - important that they not be overlearned
- Use flexibility, not rigidly or compulsively
- Live with the attitude of perceiving and judging and - everyone must judge as well as perceive (not using one in exclusion of the other - question of how each is used and which is preferred)
- Danger for one's creative potential is not the judging or evaluating of one's experience but that one prejudges, thus excluding from perception large areas of experience

- Danger in both parental and academic instruction, as well as all instruction is that new ideas and possibilities of action are criticized too soon and too often
- Continue to nurture creative potential - an equal emphasis be placed on perceptiveness

Page 494

- Creative person is not only open to experience, but intuitive about
- Can train students to be accurate in their perceptions - this too is a characteristic of the creative → how can we train them to be intuitive?
- Rote learning - learning of facts for their own sake, repeated drill of material, too much emphasis on facts unrelated to other facts, and excessive concern with memorizing can strengthen and reinforce sense of perception
- Emphasis on training from one subject to another, the searching for common principles in terms of which facts from quite different domains of knowledge can be related, the stressing of analogies, and similes, and metaphors, a seeking for symbolic equivalents of experience in the widest possible number of sensory and imaginal modalities, exercise in imaginative play, training in retreating from the facts in order to see them in larger perspective and in relation to more aspects of the larger context - achieved - other emphases in learning → strengthen the disposition to intuitive perception/thinking
- Widest possible relationships among facts are to be established, of the structure of knowledge is to be grasped, it is necessary that the student have a large body of facts which he has learned as well as a large array of reasoning skills which he has mastered
- Not proposing that in teaching one disdain acute and accurate sense perception, but that one use it to build upon, leading the student always to an intuitive understanding of what they experience
- Independence of thought/action which the subjects reveal in the assessment setting appears to have long characterized them → already manifest in high school, and tending to increase in college and thereafter
- In school architects received a B average - in work that caught their interest they could turn in an A performance → while courses that failed to strike their interest they were unwilling to do the work at all (attitude in college appears to have been one of skepticism)