

Show Notes

1) What is creativity

- Creativity is the ability to produce work that is both novel..and appropriate.”
(Robert Sternberg, 1999)
- Models of creativity -
 - Psychodynamic - sublimation of infantile sexuality
- *Creative individuals in practice are often high sexed*
 - Problem Space Theory (1972)
 - Series of states
 - Initial problem state - intermediate subgoals, goal
 - Knowledge + Heuristics applied to search problem space
 - Using mental operators
- *Doesn't apply to creativity in abstract or ill defined problems (e.g.: manned flight, new art movements)*
- Doesn't account for paradigm shifting genius
 - Cognitive Expert Knowledge Theories
 - Expert Knowledge - Allows more elaborate schema (patterns of thought / behaviour)
 - Problems encoded more effectively
 - I.e.: The expert needs to pay attention to less, since they more easily understand what is and isn't known and whats important
- *But inverse correlation between age and scientific creativity!*
 - Generative Stage Theories
 - Cognitive theory - grown out of theories of British Social psychologist Graham Wallas - The Art of Thought
 - Preparation - incubation - illumination - verification
 - Problem examined, unconscious processing, insight achieved, solution extrapolated / tested
 - Overlap in everyday life as we explore different problems
 - Generative / Explorative model - Finke, Ward & Smith. 1992
 - 2 phases of creativity
 - Spawning & elaboration (e.g.: brainstorm & execution)
 - Generative process - 'Pre-inventive structures' are built - with more creative arising from more disparate associations
 - Explorative process - Exploration and interpretation of pre-inventive structures - can be building / analysing / testing / modelling
 - Improbabilistic vs Impossibilitistic (Boden, 1991)
 - Constraints of existing conceptual space examined through analogy

- Vs - altering rules of conceptual space
 - Analogy vs Mental Models
 - Intuitive mental model - person simulates a process in the world to solve a problem
 - Analogy - people reach into knowledge of similar situation
 - Map a set of concepts onto a new framework
 - Analogue (related domain) mapped onto target
 - Level of familiarity with domain
 - Combined with cognitive flexibility - may describe originality of thoughts
 - Stage theories (including Type I & Type II with Kevin Thomas)
 - Robert Weisberg - Novelty / Usefulness [or just novelty]
 - <http://andrewspsychologyarchive.blogspot.ie/2015/10/but-is-it-creative.html>
 - Novelty and Usefulness
 - In social terms - usefulness / regard changes - both for technical inventions (e.g.: nikola tesla, ada lovelace) and art
 - Study should thus be focused on novelty - not subjective assessments of value
- *But some value assessment is necessary - since we can agree nonsense is not particularly creative (i.e.: speaking in tongues)*
 - Weisberg advocates - Consensual Assessment Technique - involves appraisal of value of a creative work - different levels of creativity - new vs new to you
 - Other possibilities - tests of 'elaboration' of an idea - complex vs minimalist ideas - need to evaluate both process and product
- Domain specific versus domain general
- Confounds in measurement - what defines creative output, what kinds of creativity are prized (e.g: historically crafts less so), successful artists / scientists perceived as more creative, breadth vs depth of output, distinction between 'problem solving' creativity and generative creativity

2) Is it possible to become more creative

Dialectical thinking / contrasting unrelated concepts

Some relatively recent evidence that de Bono's six thinking hats works:

<https://www.sciencedirect.com/science/article/pii/S1871187114000443>

What is 6 thinking hats?

Method of managing solving a problem - primarily in meetings

Edward de Bono - Psychologist & Business consultant

Separating thinking into distinct modes - to direct towards aspects of the problem

- White Hat - seeks information needed
- Yellow Hat - examine positive aspects - seek benefits
- Black Hat - judgment or negative aspects of solutions
- Red Hat - feelings, intuition or hunches
- Green Hat - creativity, alternatives, new ideas

- Blue Hat - manage which hat is worn and controls others

3) Do people innately differ in creativity

- Studying in geniuses vs regular people

Creative achievement questionnaire skewed towards lower scores-Figure 1 in **LINK IS BROKEN**

- Associative hierarchy - disparate concepts
- Why are some more creative than others
 - <https://www.scientificamerican.com/article/why-are-some-people-more-creative-than-others/>
 - 'Little C' vs 'Big C' Creativity
 - Interplay between spontaneous & controlled thinking - brainstorm & evaluation
 - fMRI study of 163 people in 'divergent thinking' task
 - High performance associated with more creative hobbies / achievements
 - Mapped 'highly creative network'
- *NB - running into fundamental issue with fMRI - is this network measuring 'flow' on the day, intrinsic structural difference, practice, self confidence etc etc*
 - 'Default Network' - spontaneous thinking / 'Executive Control Network' involved in regulating / controlling thoughts / 'Salience network' switching between both => usually one or other active, creative people may be better at co-activation
 - May indicate different neuronal 'wiring'
 - Similar findings in studies of improvising jazz, writing poetry, sketching book covers
- The Creative Personality
 - <https://www.psychologytoday.com/articles/199607/the-creative-personality?page=2>
 - Mihaly Csikszentmihalyi, author of *The Work and Lives of 91 Eminent People* **1996**
 - Studied 'highly creative people' - all 'eminent'
 - Lots of physical energy, concentration, calmness, physical health
 - Periods of idleness important
 - Highly sexual but also restrained
 - Smart but not advantage to IQ over 120
 - Combination of playfulness and discipline / endurance
 - Simultaneously introverted / extraverted
 - Humility / healthy pride
 - Psychological androgyny
 - Both rebellious and rooted in understanding / love of a given domain
 - Objective about work but passionate
 - High in trait / emotional openness

Role of Affect in creativity???? PASSION!

4) How do we measure creativity

- Torrance Tests/divergent thinking

- 1974, Cognitive tests applied to both normal and 'creatively gifted'
- Case Reports?? (e.g. Watson & Crick, Picasso's "Guernica")
- Self Reports - e.g. creative achievement questionnaire(s) Jordan Peterson

5) Why did creativity evolve

Acquisition of social status (Pinker, 2002)

Impress mate

Concrete problem solution - e.g.: new food sources, ways of living

Spandrel of big brains

Social bonding functions - i.e.: play extended into later life through music, art making

6) Creativity in other animals

Artistry? Problem solving?

- Competitiveness negatively correlated with problem-solving performance in 'Great Tits', positively correlated with exploratory behaviour (UCC)
- <http://rspb.royalsocietypublishing.org/content/early/2011/09/14/rspb.2011.1539.short>

Towards a neurobiology of creativity in non-human animals (2011)

Summarised various non-human studies

- Three Level model of creativity
 - a) cognitive capacity to recognise and seek out novelty (hippocampal function, dopaminergic systems)
 - b) observational learning (cerebellum)
 - c) innovative behavior (pre-frontal cortex)
 - <http://psychology.uga.edu/sites/default/files/Kaufman%20et%20al%202011%20-%20Towards%20a%20Neurobiology%20of%20Creativity%20in%20Nonhuman%20Animals.pdf>

7) Creativity and well-being

- Creativity and mental health/depression

http://www.sciencecodex.com/creativity_linked_to_mental_health

=> Fredrick Ullen, Karolinska Institutet Department of Women's and Children's Health

'Thinking Outside a Less Intact Box: Thalamic Dopamine D2 Receptor Densities Are Negatively Related to Psychometric Creativity in Healthy Individuals', Örjan de Manzano, Simon Cervenka, Anke Karabanov, Lars Farde & Fredrik Ullén, PLoS ONE, online 17 May 2010.

Similarity of dopaminergic system in 'highly creative people' with schizophrenics

Less D2 receptors in thalamus - filtering centre for information, implicated in cognition / reasoning

Probably means less filtering of signals

Dopaminergic system linked with 'divergent thought' - i.e.: capacity to find diverse solutions to a problem

Linked with family mental illness

Higher risk of schizophrenia and bi-polar disorder

Weisberg again: historical analysis suggest Schumann's manic periods associated with greater quantity, but not quality of work:

<http://journals.sagepub.com/doi/abs/10.1111/j.1467-9280.1994.tb00286.x>

Shared traits with schizophrenics - bizarre associations