Innovation & Brainstorming

"The best way to a good idea is to have lots of ideas." - Linus Pauling
**Clarification**

**discovery**
- *elemental fluorine*
  - 1886 - Henri Moissan
- *Discovery* is finding something that already exists that no one found before

**invention**
- *“teflon”*
  - 1938 - Roy Plunkett
- *Invention* is creating something that has never existed before. Not a product, but a technology.

**innovation**
- *non-stick pan*
  - 1954 - Marc Gregoire
- *Innovation* is the application of new ideas or the combination of existing items in a novel way. This is product design.
Quiz!

1. What is your gender?
2. What is your age?
4. List as many uses as you can for a paper clip.
Alternative Uses Test
J.P. Guilford 1967

a measure of divergent thinking
The best way to have a good idea is to have a lot of ideas.
-Linus Pauling

Quantity vs. Creativity

quantity of ideas vs. creativity of ideas per subject

$R^2 = .82$

Kudrowitz and Wallace, 2010
Improv Games
Associative Theory

Cyrus McCormick

Mechanical Reaper

(mednick 1962)
**Associative Theory**

Right, Posterior Superior Temporal Sulcus (PSTS)
- processing novel metaphors in poetry (Gorana et al 2008)
- novel connections between unrelated words (Mashal et al 2007)
- RH equivalent of Wernicke’s area - linguistic creativity (Flaherty, 2005)

Right, Anterior Superior Temporal Sulcus (ASTS)
- “Aha!” Experience (Jung-Beeman 2004)
Humor

Humor can be dissected, as a frog can, but the thing dies in the process and the innards are discouraging to any but the pure scientific mind. –E.B. White

Incongruity Theory

Superiority Theory

Release Theory
Where does the general keep his armies?  
- tents?  
- army base?

In an army base.

In his sleevies.

“armies” has two meanings:

What are sleevies?

No surprise no laughter

No puzzlement confusion

Find rule that makes ending follow from set-up

Surprise

Is ending as predicted?

Yes

The read-in or set-up

Prediction of outcome

No

A two stage mode of joke appreciation by Jerry Suls

Humor, incongruity theory of
Association Mapping
Association Mapping

Biopsy Needle $\rightarrow$ Form: long thin tube $\rightarrow$ Finger Trap
sometimes the most powerful ideas come from simply combining two existing ideas nobody else ever thought to unite. most inventions and breakthroughs come from reassembling existing ideas in new ways. - pink

“Reese’s Peanut Butter Cup Theory of Innovation”
Crossing Products

Gutenberg’s Printing Press

= 

+ 

Grapes
Crossing Products

"the enscribe" whiteboard table
Crossing Products

The **Strumbone**: the guitar played like a trombone
Crossing Products

“Someone who is relaxed, happy, in a pleasant mood, is more creative” -Donald Norman

Crossing Products

Write down the name of three products

Exchange
Types of Ideation

Free Form or Intuitive Methods
- Group Writing:
  - Brain Writing
  - Brain Sketching
  - Collective Notebooks
  - Pin cards
  - KJ method
  - Trigger sessions
- Free Writing
- Brainstorming

Structured or Logical Methods
- Morphological Analysis
- Attribute Listing
- Potential Problem Analysis
  - TRIZ
  - ARIZ
  - ASIT
  - SCAMMPER

New Perspectives techniques
- Lateral Thinking
- Challenging Assumptions
- Boundary Relax
- Negative Brainstorm
- Reversal
- Exaggeration
- Rolestorming
- 6 Thinking Hats
- Super Heroes
- Disney Method
- Progressive Revelation
- Laddering

Associations techniques
- Provocation
- Bunches of Bananas
- Excursions
- Brutethink
- Analogies
- Force Fit
- Focal Objects
- Mind Mapping
- Free Association
- Association Mapping
Brainstorming

To generate LOTS of Ideas.... quickly.

Quantity of Ideas vs. Overall Creativity Score per Subject

R² = 0.81952

Total Number of Creativity 2-Scores

Total Number of Product Ideas
Brainstorming

- Problem statement
- 5-9 people
- 20-40 minutes
- Room/situation
- 1 facilitator and lots of paper

Bounded Ideation Theory
Brainstorm Sketching

Quick and Clear

Draw Big and Bold

Label

Brief Pitch

Record

Repeat

FART DARTS

ONE IDEA/PAGE
Brainstorming

“In short: there are no rules. And here they are.”
—Scott McCloud, Making Comics.

1. Defer Judgement.
NO EVALUATION

people become self conscious

silly ideas are good

“If at first, the idea is not absurd, then there is no hope for it.”
~Albert Einstein

evaluate later

evaluation = left brain
creativity = right brain
Switch Left Brain to Silent Mode
Brainstorming

"In short: there are no rules. And here they are."
— Scott Mc Cloud, Making Comics.

yes 1. Defer Judgement.
NO EVALUATION

and 2. Build on ideas
Improvisation Warm-up

- Bonding
- Playing
- Comforting
- Lowering inhibitions
- Listening
- Making associations
- Manipulating ideas
- Building on ideas
- Going for quantity
- Deferring judgement
- Encourage wild ideas

36% more ideas!

Kudrowitz and Wallace, 2010
zip zap zop
listening.
being ready to act.
samurai
listening.
being ready to act.
word ball
listening.
being ready to act.
making associations
illogical word ball
listening.
being ready to act.
making associations
look at me!
manipulating an idea.

“Discovery consists in seeing what everyone else has seen and thinking what no one else has thought.”
-Albert Szent-Gyorgyi
tigers and bears

going for quantity.
derer judgement.

quantity of ideas vs. creativity of ideas per subject

$R^2 = .82$

kudrowitz and wallace, 2010
tigers are great!
take a hundred americans off the street and ask them to free-associate on the word “green” and forty of them will say “grass”. the more creative associations only emerge when you get to the bottom 20 percent of responses, the long tail of associations.

- Johnson in “Where Good Ideas Come From”
1. Defer Judgement. NO EVALUATION
2. Build on ideas
3. Encourage wild ideas
4. Go for quantity
IPM (PP)
ideas per minute per person

>1.0 ipm (pp)

5 people,
15 min = 75 ideas
Sorting Ideas
KJ-Method, Snowball Technique, or Affinity Diagrams
multi-voting
THINK LIKE A DESIGNER

PDES 5701
creativity, idea generation and innovation
(first 7 weeks) MW 12:50 - 3:50

PDES 5702
concept sketching and rendering
(second 7 weeks) MW 12:50 - 3:50
Toy Product Design PLAYsentations

Wednesday May 2nd 730pm
Bell Museum Auditorium