

Finding Our Place in a Connected World

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XII International Congress of Ergonomics
SEMAC
Ciudad Juárez, Chihuahua, Mexico
7 May 2010

Typical consulting project

Two months ago



This week



¿Qu estas haciendo?



Outline

- Ergonomics' past and future contributions
 - Four generations
- Four Trends and implications for our future
 1. Patterns of change
 2. Attracting attention
 3. Ethical boundaries
 4. Ergo-genesis

Four Generations of Human Factors and Ergonomics (from Boff, 2006)

Generation	Focus to Fit	Strategy	Stage*
1	Physical	Adapt equipment, workplace and tasks to human capabilities and limits	Mature
2	Cognitive	Harmoniously integrate humans, technology and work to enable effective systems	Growth
3	Neural	Amplify human physical and cognitive capabilities to perform work through symbiotic coupling with technology	Emerging
4	Biological	Biologically modify physical and/or cognitive capabilities to maximize human effectiveness	Embryonic

Trends and Implications for our Future

- How can I affect Generations 3 and 4?
 - My work is not in robotics, prosthetics, psychopharmacology or nanotechnology
 - How can my work influence these futures?
 - What unique skills do I bring?

We do have an opportunity to affect the future

Trend 1 – Patterns of Change

- Chaos Theory
 - Strange attractors
 - Dependence on initial conditions



Initial Condition



Dependence on Initial Condition

Initial Design



Current designs



Designs that shaped the future



Designs that shaped the future



Designs that shaped the future



Designs that shaped the future



Designs that shaped the future



Designs that shaped the future

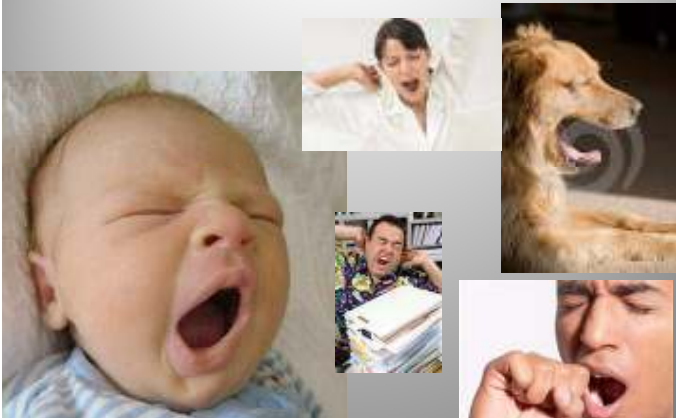


Trend 1 – Patterns of Change

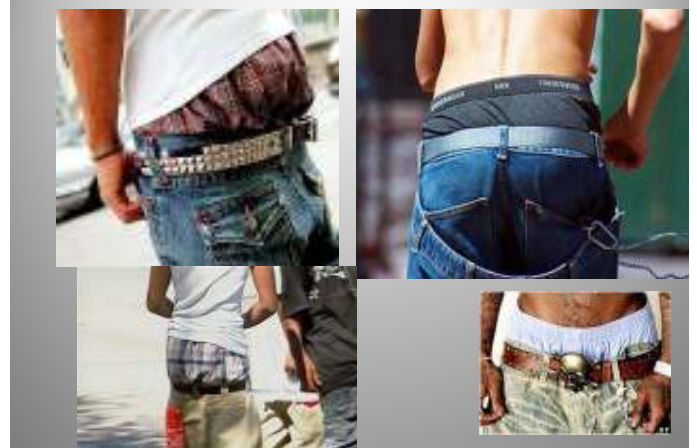
- Chaos Theory
 - Strange attractors
 - Dependence on initial conditions
- “Tipping Points”
 - Change as a virus
 - Socially contagious



The Power of Social Contagion



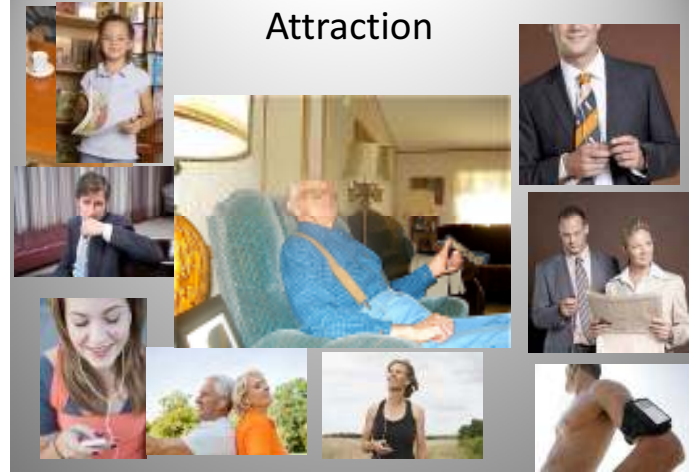
Change as a virus – “Sagging”



Trend 2 – Attracting Attention

- “A whole new mind” – Daniel Pink
 - Design
 - Story
 - Symphony
 - Empathy
 - Play
 - Meaning

Attraction



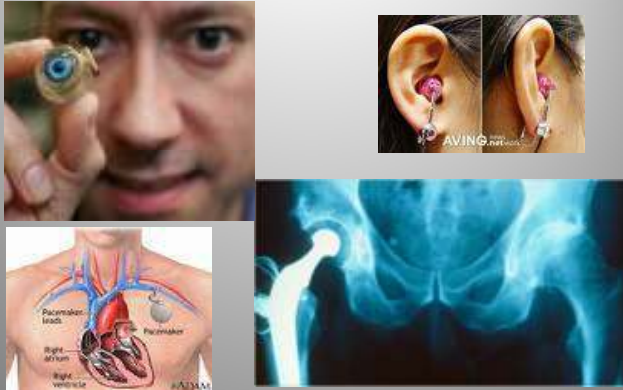
Trend 3 – Ethical Boundaries

- It may be unethical to withhold Generation 1 and 2 ergonomics
- It may be unethical to alter humans to fit Generation 3 and 4 ergonomics

Generation 1



Generation 3



Generation 3



Trend 3 – Ethical Boundaries

- Weighing human desires, system requirements
 - If there were a drug that would allow you to ____, and not be detected by anyone, would you take the drug?
 - If there was a 75% chance that you would die within five years after taking the drug, would you take the drug?

Generation 4 Ergonomics ?



What if ...



Generation 4

Memories Selectively, Safely Erased In Mice

ScienceDaily (Oct. 23, 2008) —

Targeted memory erasure is no longer limited to the realm of science fiction. A new study describes a method through which a selected set of memories can be rapidly and specifically erased from the mouse brain in a controlled and inducible manner. New and old memories have been selectively and safely removed from mice by scientists.



See also:

Health & Medicine

- Nervous System
- Brain Tumor
- Alzheimer's Research

Mind & Brain

- Memory

"While memories are great teachers and obviously crucial for survival and adaptation, selectively removing incapacitating memories, such as traumatic war memories or an unwanted fear, could help many people live better lives," says Dr. Joe Z. Tsien, brain scientist and co-director of the Brain & Behavior Discovery Institute at the Medical

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Trend 4 – Ergo-genesis

- "Multiples"- inventions or discoveries that occur simultaneously or independently
- Ogburn and Thomas (1922) identified 148 multiples
 - Telephone
 - Calculus
 - Color photography
 - Logarithms
- Challenges assumption of individual genius. Great ideas may be inevitable, "in the air"

Trend 4 – Ergo-genesis

- What if...
 - Solutions are inevitable
 - Bringing together smart, experienced people can generate a genius solution
 - Just by creating an intellectual climate, stimulation, tools and expectation can generate breakthrough ideas

Gleck cites a venture where a group has patented 500 ideas a year, 3,000 idea backlog

Trend 4 – Participatory Ergo-genesis

- Participatory Ergonomics
- Examples of engaging stakeholders, workers, customers, or users to create “inevitable solutions”
 - Agricultural workers (Kogi, 2008)
 - Truck drivers (Imada, 2002)
 - TQM in manufacturing (Imada, 1981)
 - Meatpacking (Gjessing, et al, 1994)
 - Construction (van der Molen 2005)

Trend 4 – Participatory Ergo-genesis

Appreciative Inquiry (Cooperrider & Whitney, 2005)

1. Discovery. What gives it life?
2. Dream. What might it be?
3. Design. What should be the ideal?
4. Destiny. How to empower, learn, adjust, improvise?

Finding our Place in a Connected World

- It will not happen as we expect
- Your unique left/right brain combination will make a difference
- It will not be easy and may be uncomfortable
- Engaged people can create breakthrough ideas if we provide the environment and expectation

Wishing you a comfortable place in
our connected world!

Thank you for
your kind attention and invitation