NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH

Division of the National Health Laboratory Service





ERGONOMICS & COVID-19

WHAT ARE THE LESSONS LEARNT
Cognitive aspects of working during COVID-19

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Healthy, Safe, Happy & Sustainable Workplaces

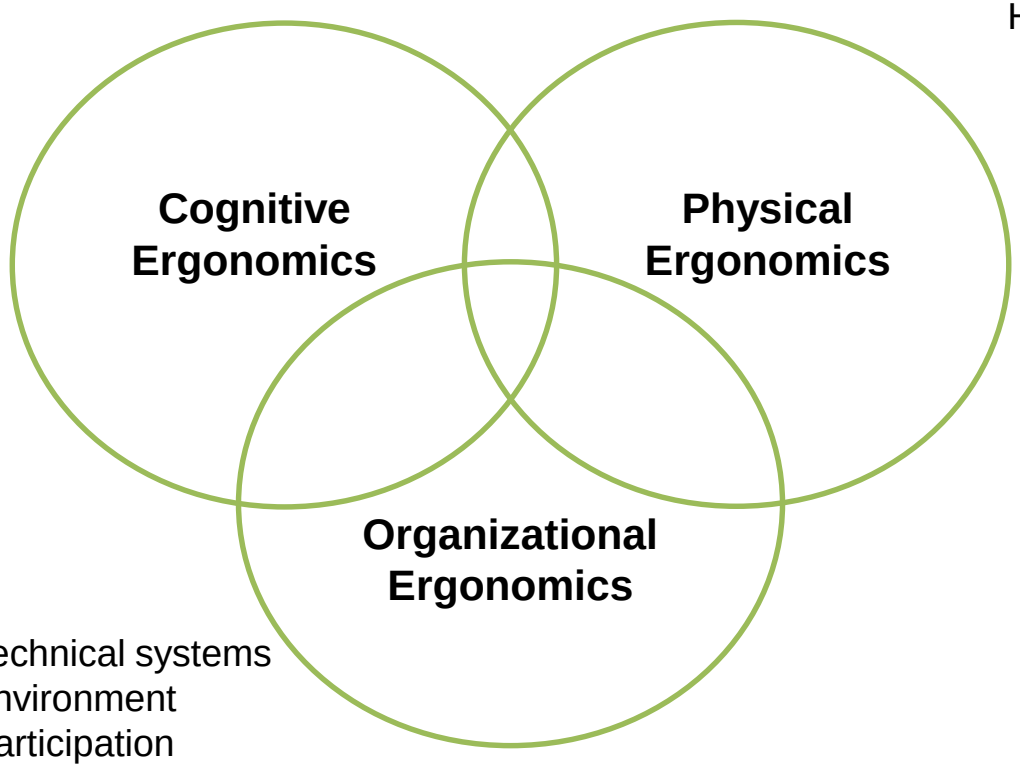
PROMOTING DECENT WORK THROUGH CUTTING EDGE RESEARCH, SPECIALISED SERVICES, INFORMATION, TEACHING AND TRAINING

Presentation Outline

- Domains of specialization
- Aim of Cognitive Ergonomics
- Corona Virus 2019, (COVID-19)
- Ergonomics and COVID-19
- Lessons learnt

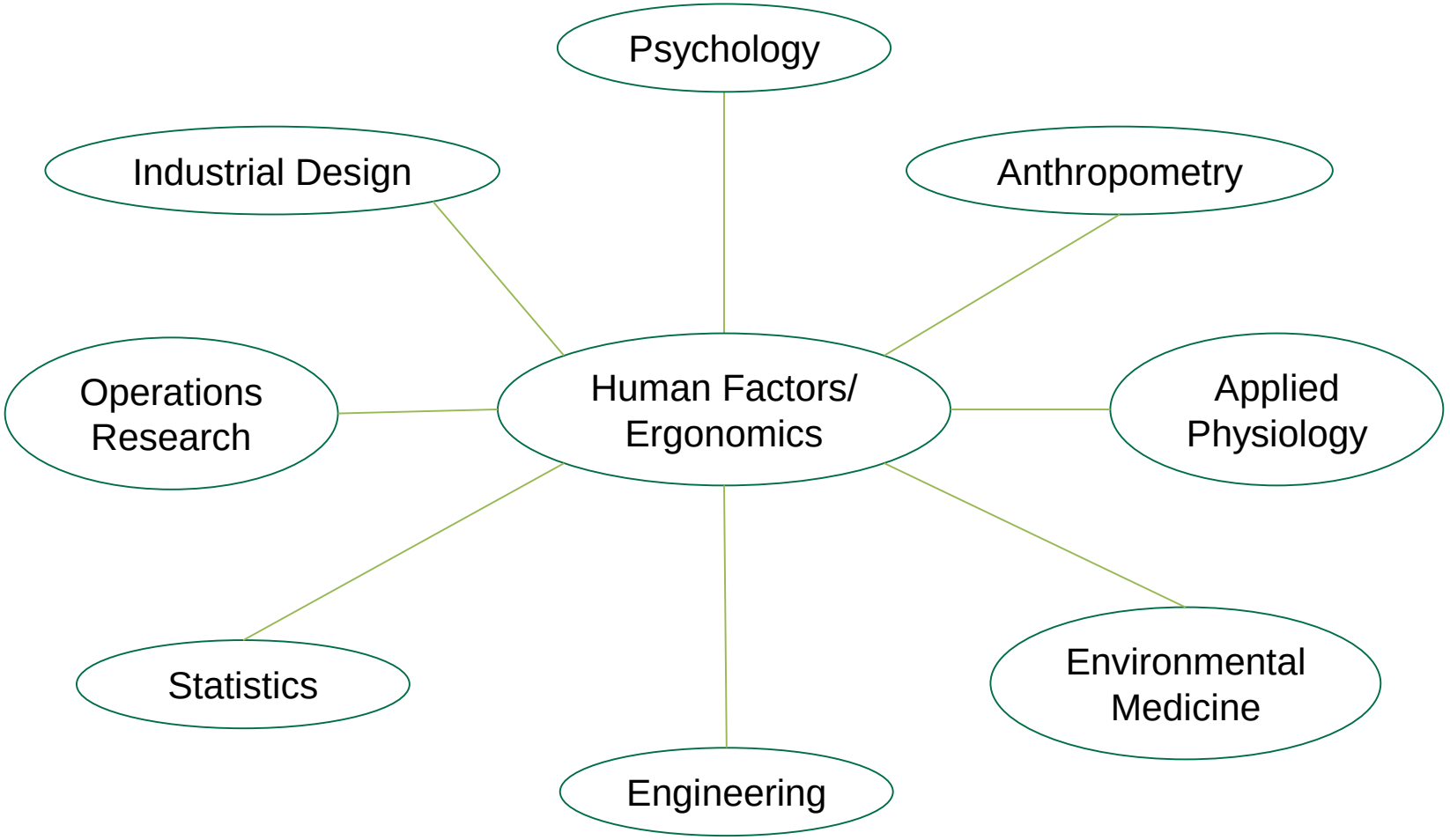
Domains of specialization[1]

Memory
Perception
Attention
Communication



Human Anatomy
Biomechanics
Physiology
Anthropometry

Socio-technical systems
Environment
Participation



2. Chapanis, 1996.

Cognitive Ergonomics

- The aim of Cognitive Ergonomics is to describe[3]:
  1) How work affects the mind
  2) How the mind affects work

- The reliability of performance – cognition – become central issues

- Topics under domain include (but not limited to):
  - Mental workload
  - Decision making
  - Human-computer interaction
  - Work stress
  - Etc.

Cognitive Ergonomics

- Cognitive functions – brain-based skills
- The discipline aims to enhance performance of cognitive tasks through various interventions, such as:
  - User centred design of human-machine interaction and human-computer interaction (HCI);
  - Design of information technology systems that support cognitive tasks;
  - Work redesign to manage cognitive workload and increase human reliability; and

Corona Virus 2019 (COVID-19)

- Novel Corona Virus 2019 (COVID-19) necessitated restrictions be put in place to curb the spread infection
- Series of restrictive control measures, e.g.:
  - Lockdowns;
  - Physical distancing;
  - Self-isolation and quarantine; and
  - Use of Personal Protective Equipment (PPE)

Ergonomics & COVID-19

- Heath care system (not only in SA) not adequately designed to support human performance for a large scare health crisis

- Lack of systematic consideration of complexities of human cognition and behaviour, in pandemic preparation and response

COVID-19: What have we learnt?

- Prevalence of acute stress, anxiety and depressive symptoms (mental health)
- Temporal perception – relevant aspect that emerged during the pandemic
  - Perception of time
- 1st lockdown, a slowdown in the perception of time was associated with older age, increased stress, reduced workload and lower levels of social interactions
- In younger adults, a slower perception of time was associated with higher levels of depression, anxiety and stress and a slower perception of time as compared to prior the lockdown
- **Perception of time – related to prospective memory (PM)[4]**

Sensory perception

- Importance of olfactory in human perception and performance[5]
  - Can be used as another form of redundant sensory coding, just as we used multiple forms of visual, auditory and tactile coding in human-system communication

- Most COVID-19 patients have demonstrated loss of smell – which was one of the COVID-19 symptoms

- Typical classes of smell function
  - Related to ingestion
  - Social communication
  - Environmental hazards

Use of Personal Protective Equipment (PPE)

- Research found that PPE impacted[6]:
  - Visual perception,
  - Auditory perception,
  - Gait and balance,
  - Vision and hearing,
  - Cognitive functioning, and
  - **Communication and teamwork**

- Communication
  - PPE discomfort
  - Hearing and Speech Comprehension
    - Impact on team and individual performance

Take home messages

1) Ergonomics is about more than the physical factors of work;

2) It is important to consider how work affects the mind, and vice versa;

3) The impact of COVID-19 on work should not be in vain - Learn from what has been.

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THANK YOU

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2. Chapanis, A. 1996. Human Factors in Systems Engineering. John Wiley & Sons.

3. Hollnagel, E. 2010. Cognitive Ergonomics: it's all in the mind. Ergonomics, 40(10), 1170-1182.

4. Pisano, F., Torromino, G., Brachi, D., Quadrini, A., Incoccia, C. and Marangolo, P. 2021, A standardized Prospective memory evaluation of the effects of COVID-19 confinement on young students.

5. Cameron, E.L. 2021. Effects of COVID-19 on Sense of Smell: Human Factors/ Ergonomics Considerations.

6. Parush, A., Wacht, O., Gomes, R. and Frenkel, A. 2020. Human Factor Considerations in Using Personal Protective Equipment in the COVID-19 Pandemic Context: Binational Survey Study. Journal of Medical Internet Research, 22(6).