Towards a cognitive working life

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Mechanical routine work towards qualified process-oriented work

Line production towards project organized production

Manually agent work towards several platform (computerized) work

What should an inspector inspect when the work environment become more invisible?

How to make the invisible visible?

But first, a little about emotions and cognitions!

What is to worry?

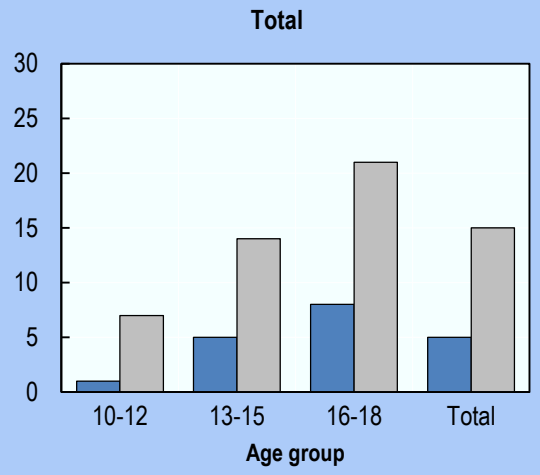
Advantageous and disadvantageous

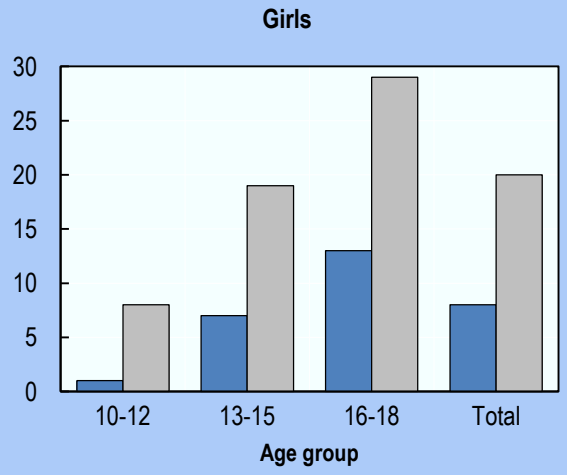
Worries about children, about losing work

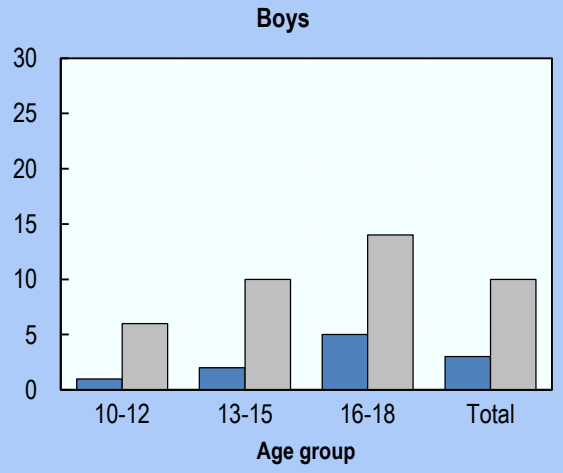
New technology only partly supportive

Prospective memory (and limbic functioning)

Mental health problems among pupils in schools are high







OECD 2013 (data from 2010, Sweden)

Waiting times to consult a school psychologist are very long

State school	10 weeks
Private school	22 weeks

OECD 2013 (data from 2010, Sweden)

Towards a cognitive working life

Transition of ill health

School

A cognitive demanding working life

We know to little about this transition today!

Disturbed cognitive functions accentuates by

a cognitive demanding working life

ADHD
Asbergers (autism)
Dyslexia (dyscalcalia)
Low cognitive capabilities
Mood/affective problems
Other psychiatric problems

In science, cognition is a group of mental processes: attention, memory, producing and understanding language, learning, reasoning, problem solving, and decision making

Various disciplines, psychology, neuroscience, medicine, philosophy, linguistics, sociology, AI and computer science

Information processing

Closely related to concepts such as mind, intelligence, mental functions, mental processes (thoughts), and states of intelligent entities (humans, collaborative groups, human organization, highly autonomous machines, and artificial intelligence (AI)

Individual differences in processing information.

Different work demands regarding processing information

Procedur memory

Fordism, Taylorism

Mental assembly line?
Working memory

Short mental work cycles, little sensory input

There is in some cases an innocent approach to the IT technology which allow for a rigid and hard control of our cognitive features

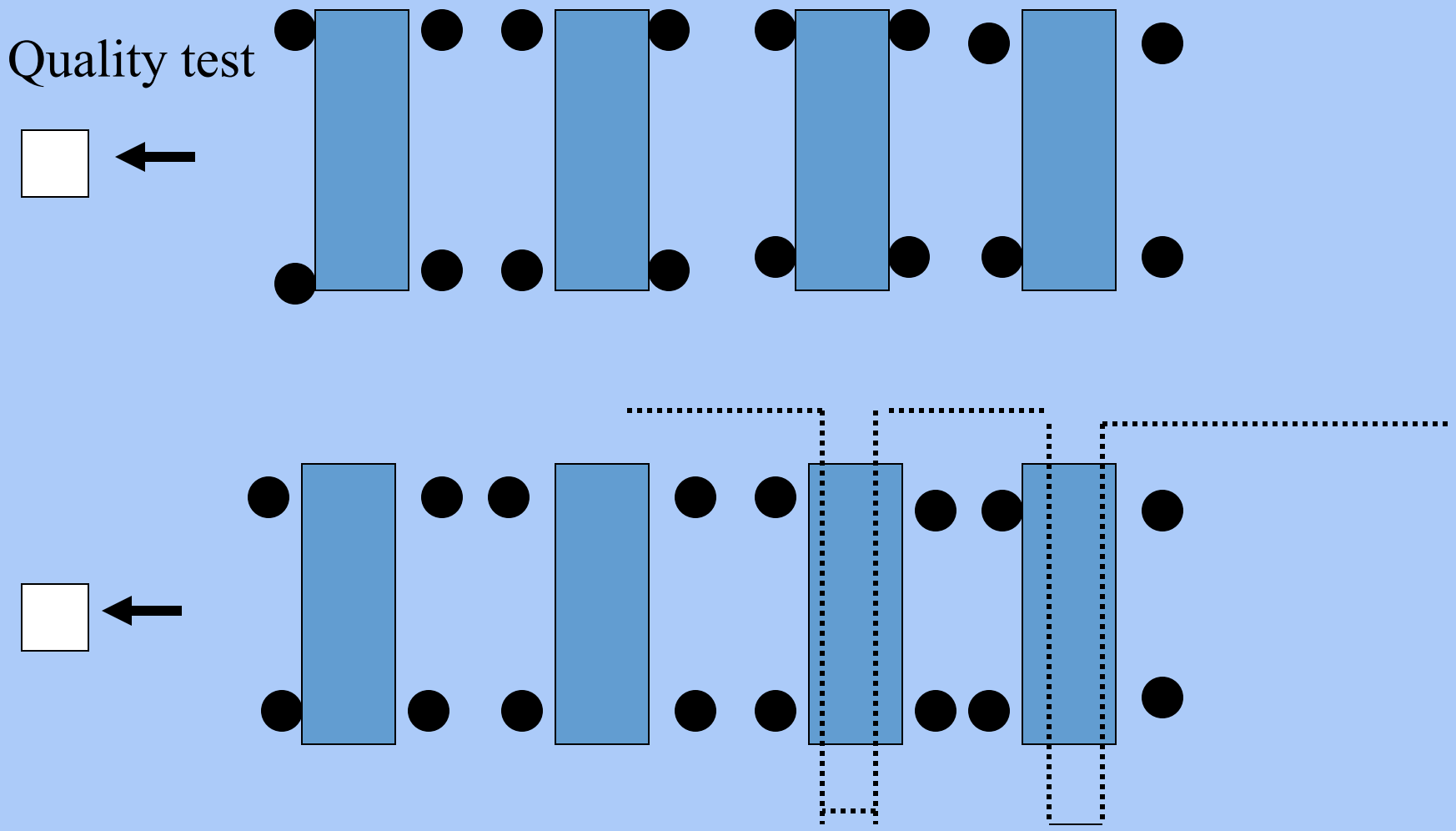
This has consequences on several levels!

The assembly industry back to short workcycles

The 90ties an experimental era with group/team dynamics (asks for higher skilled workers, higher cognitive demands)

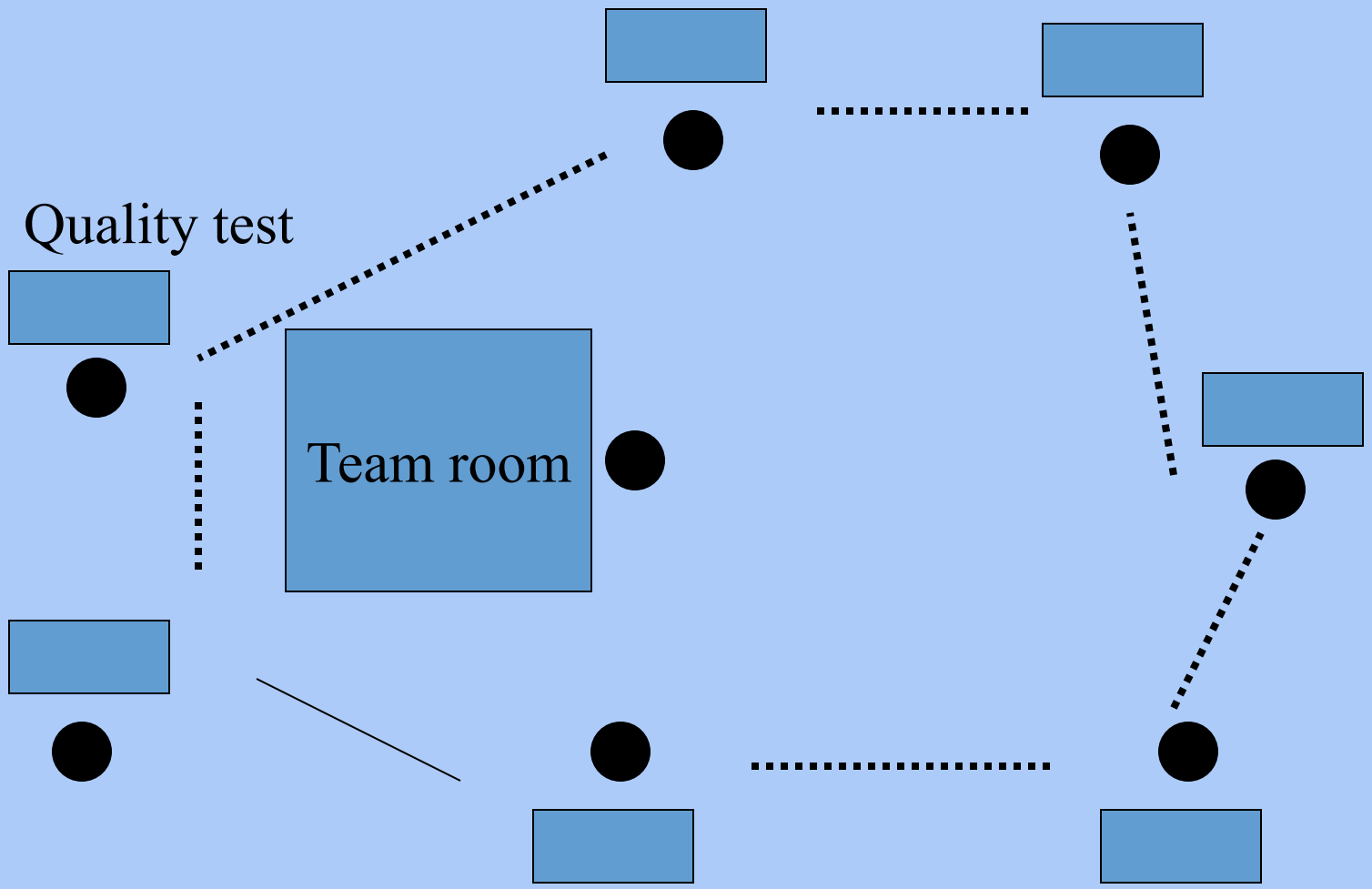
More easy, less expensive to learn short workcycles

Engine assembly (traditional)

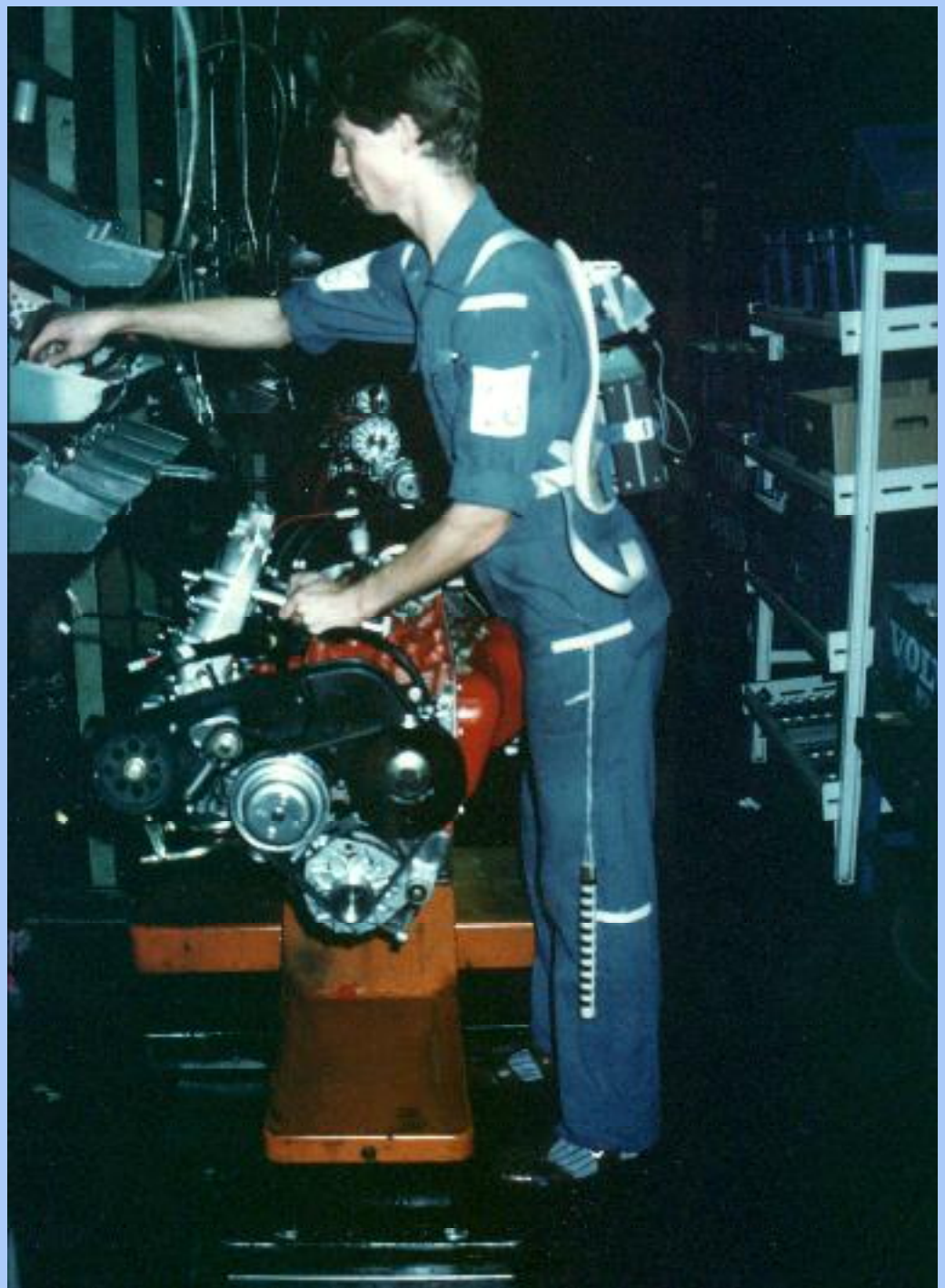


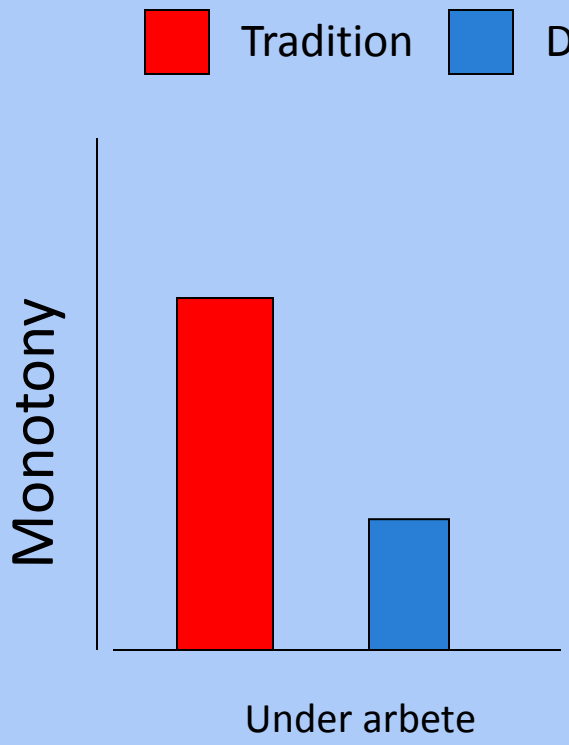
Melin et al 1999

Engine assembly line (dynamisk)



Melin et al 1999





Corresponding results: benefits

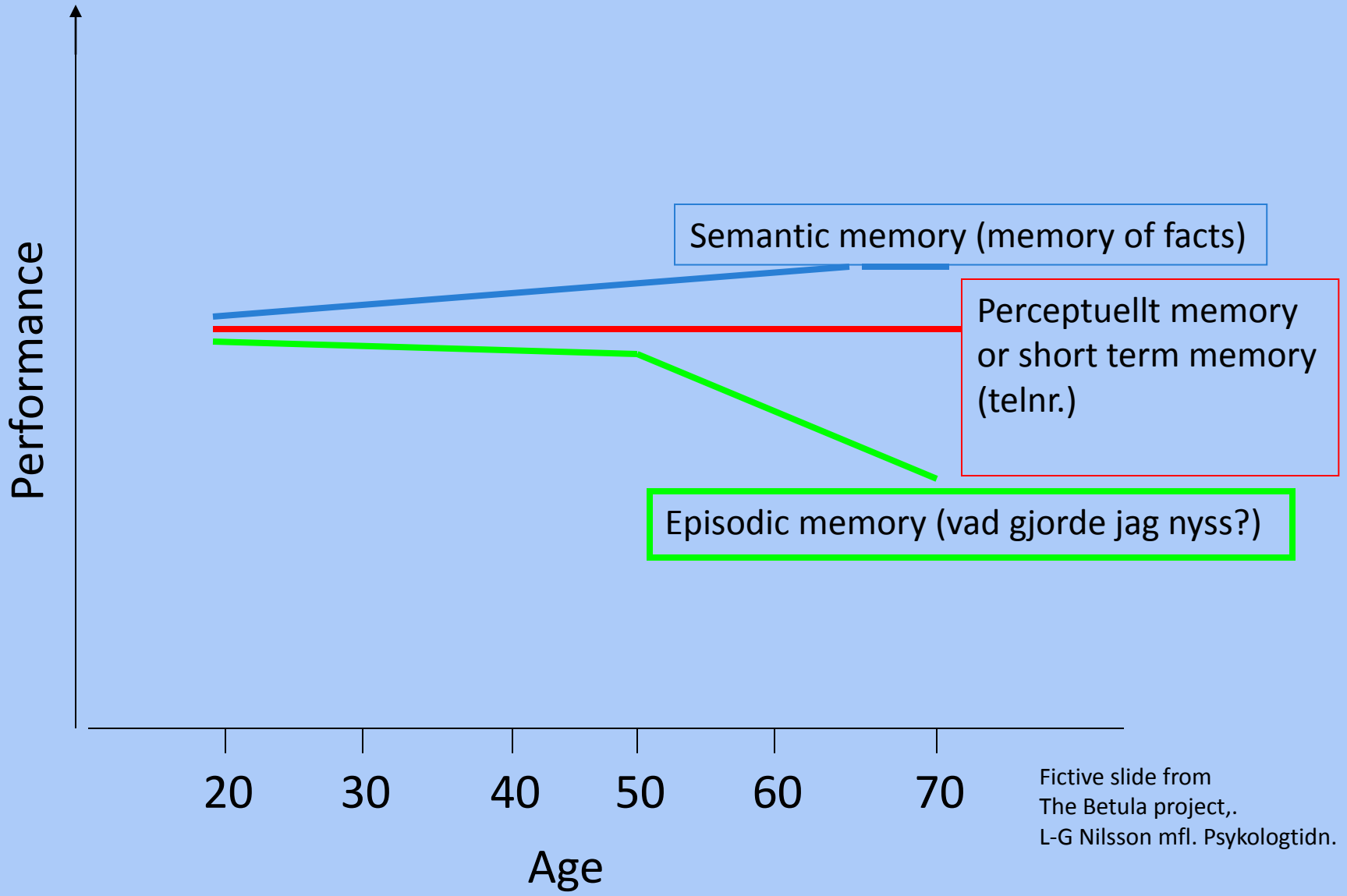
Other psychosocial aspects

Catecholamines
Blood pressure

Productivity and quality

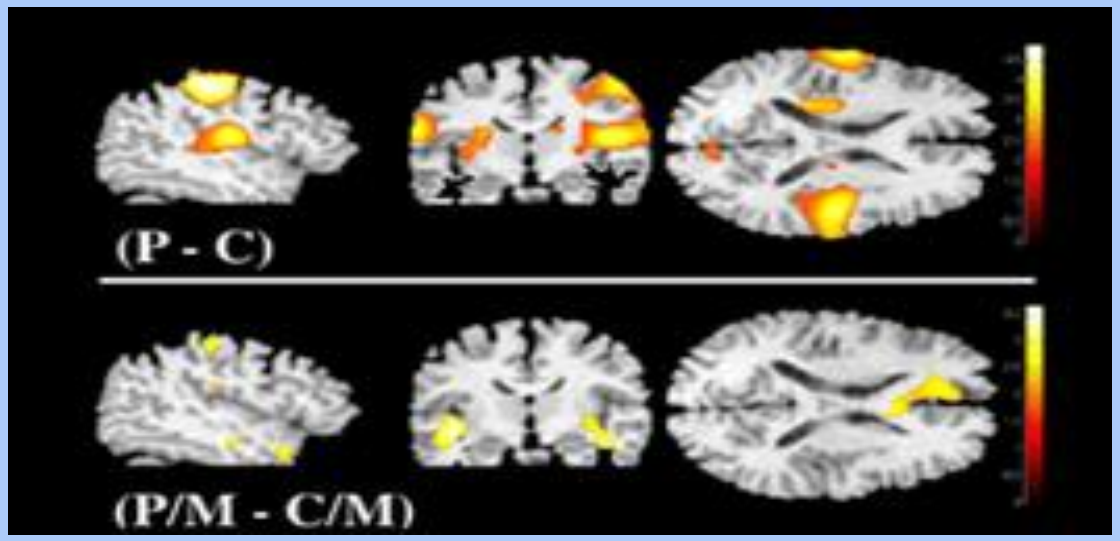
Melin et al. 1999

Age and Memory Performance



Fictive slide from
The Betula project,.
L-G Nilsson mfl. Psykologtidn.

Working memory performance increase stress and supress pain

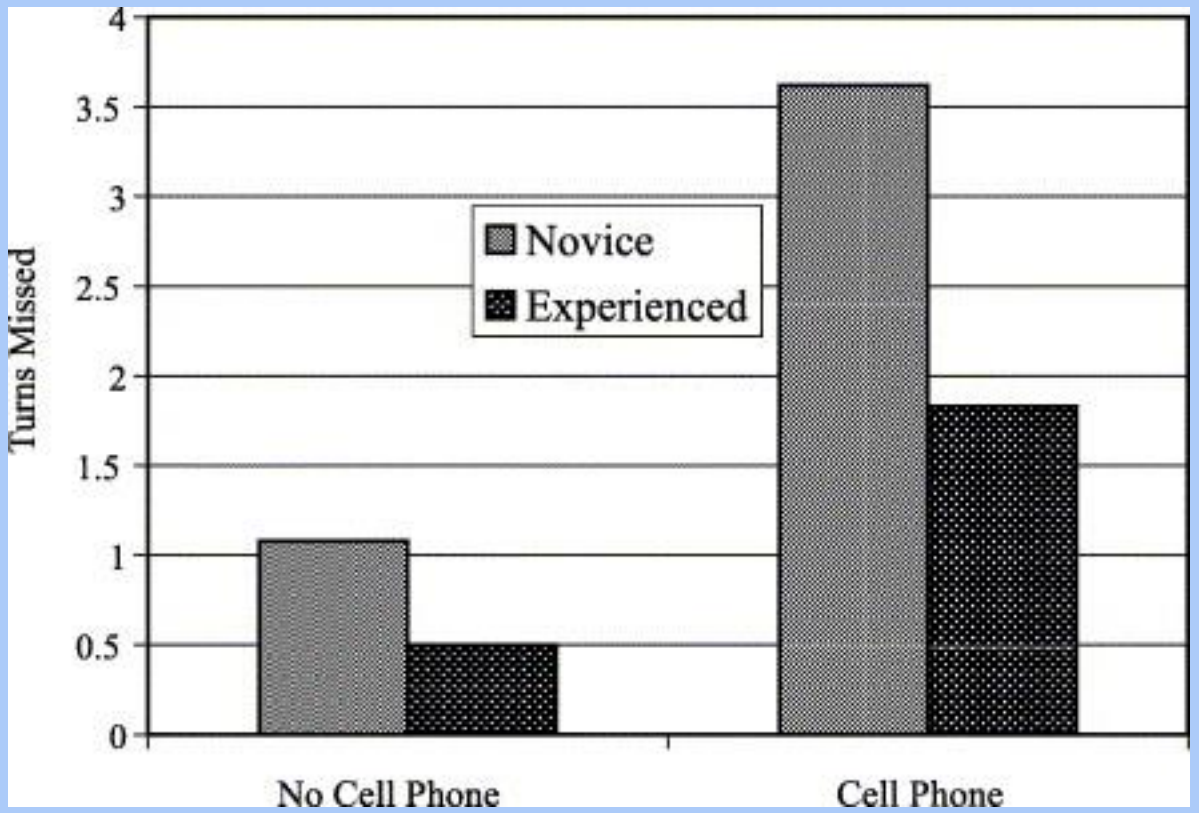


Övre bilden visar områden som deltar i bearbetningen av smärta vid köldtest. Denna aktivitet försvinner (nedre bilden) då försökspersonerna på samma gång måste lösa labyrinttestet samtidig minskar smärtans intensitet.

E.g. cashier workers pain

Referens:
Petrovic P, Petersson KM, Ghatan PH, Stone-Elander S, Ingvar M. Pain-related cerebral activation is altered by a distracting cognitive task. Pain, 85 (2000): 19-30.

Adding cognitive demands while driving a car in a simulater



Cole, et al (2007)

Individual differences: cognitive aspects

In a lifetime helicopter perspective: we are all sorted into life circumstances by:

SES: into what SES are we born
Education, pre-school – university
Gender
Intelligence

Gravitation=democracy - meritocracy

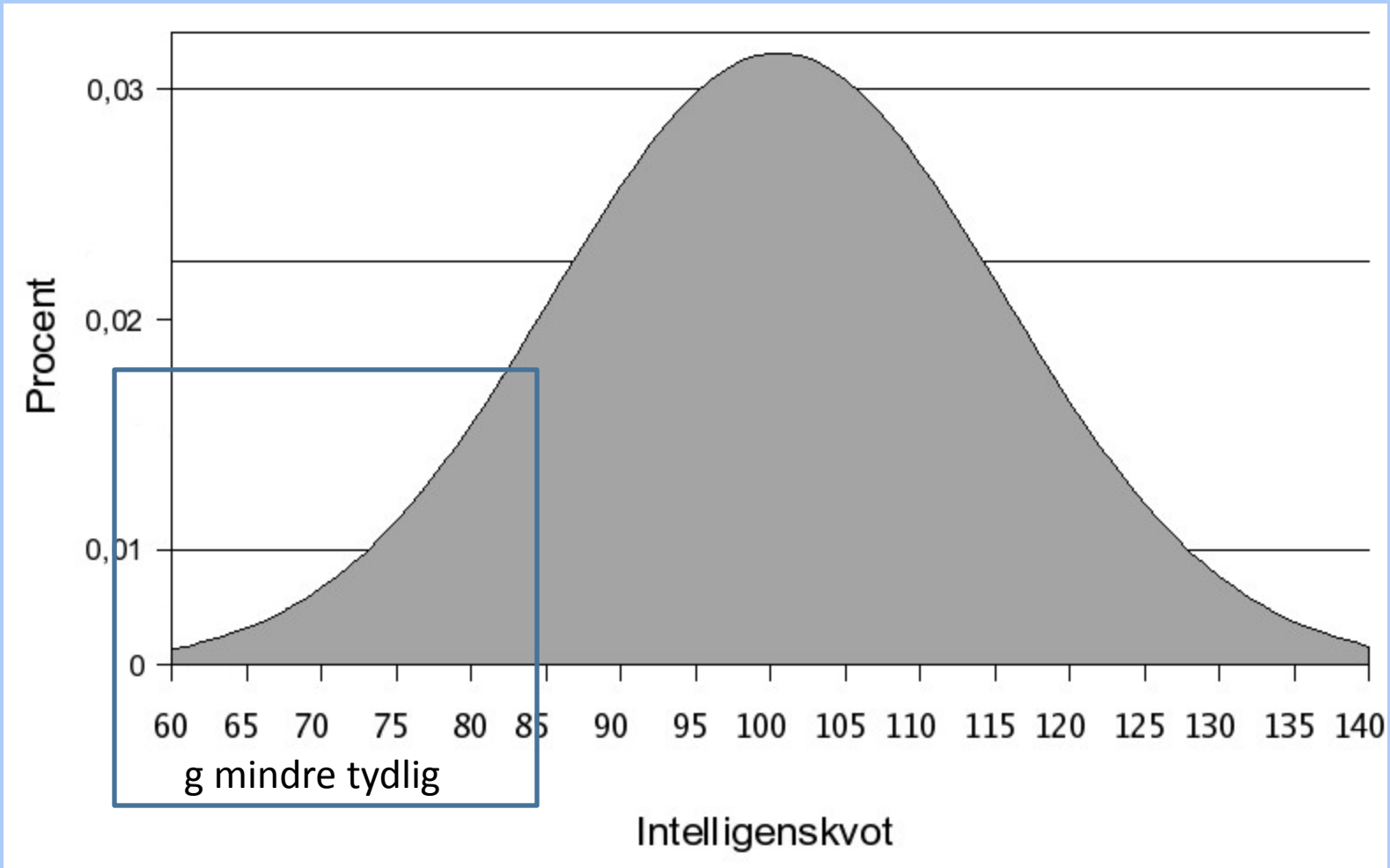


Illustration 1 Distribution of Intelligence (IQ) across the population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Intelligence has its own fine calibrated effect on achievement

Independent of
Social class
Education
Gender

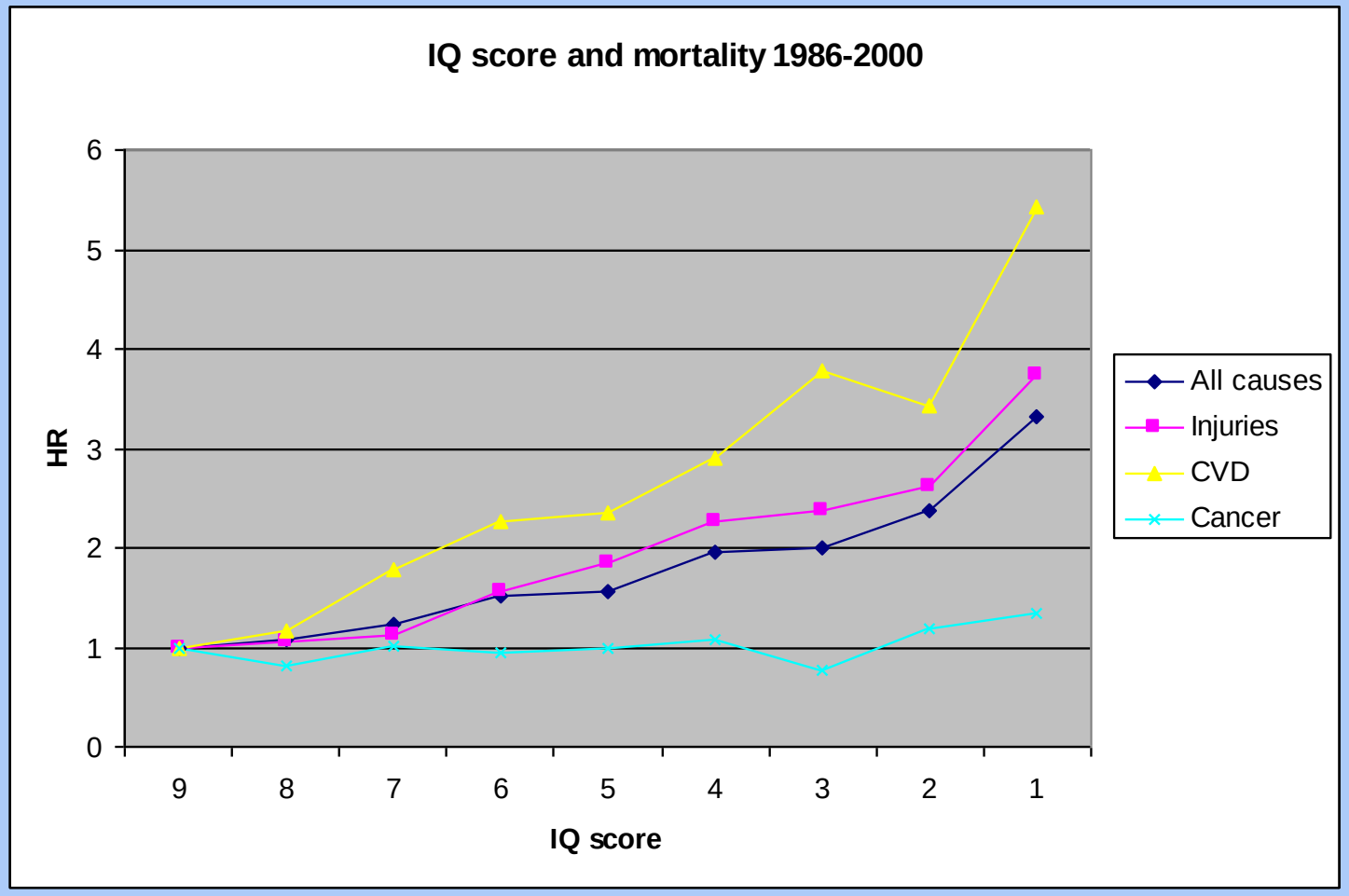
Comparison with England, USA

Sorjonen, Hemingsson Melin 2011 Scand J Psychology
Sorjonen, Hemingsson, Melin 2012 Intelligence
Sorjonen, Deary, Melin in press Intelligence

No gravitation in dictatorships

Pronounced heredity in cognitive performance

Swedish Conscript Study (49 848 subjects followed during 30 years)

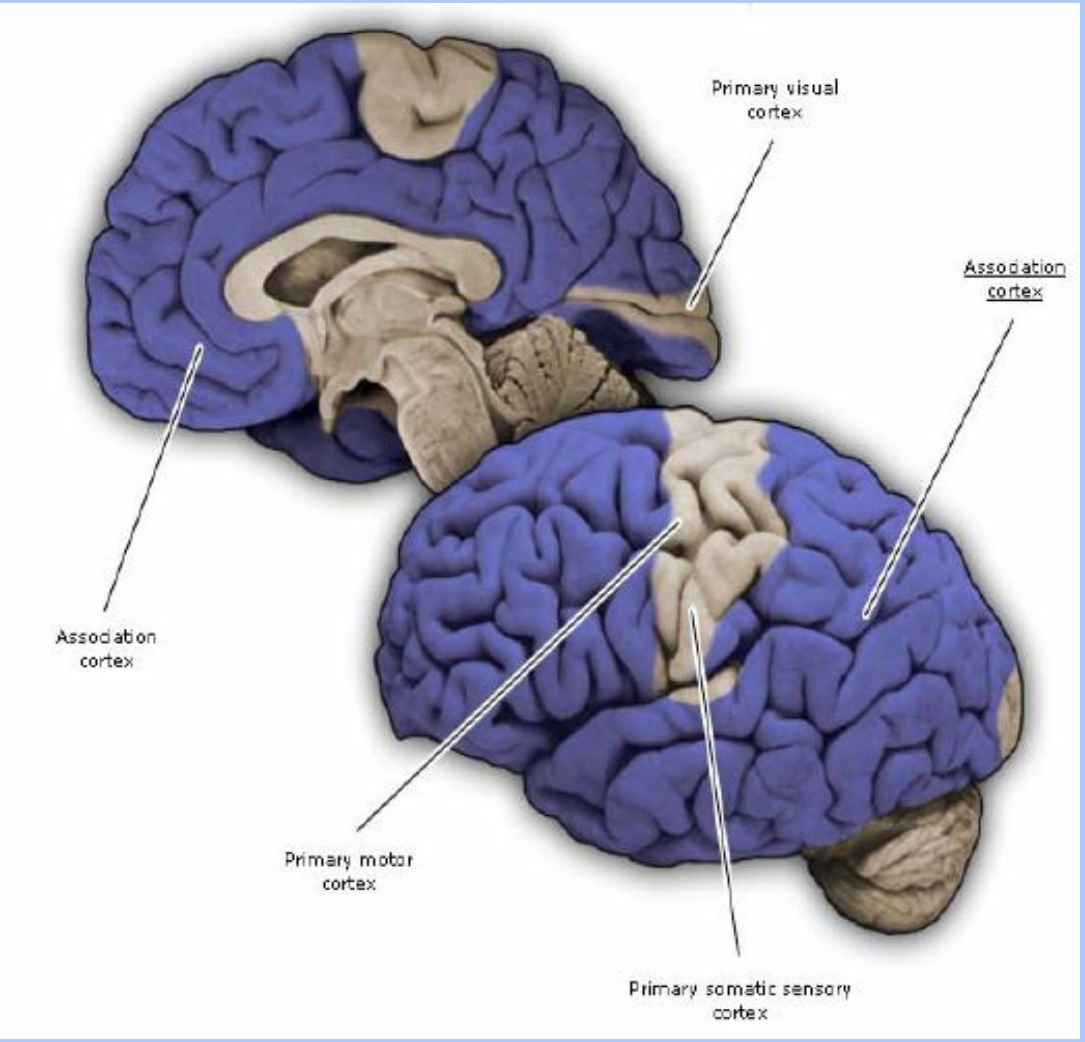


Hemmingsson, Allebeck, Melin 2006. Int J Epidem

Association cortex

Almost 80% av cortex total volume utgörs av Associations-cortex.

Function: Integrate information
”cognition”



Hypothesis

Intelligence ’system integrity’?

Deary et al. 2006

Hypothesis

Intelligence ’system integrity’?

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What should an inspector inspect when the work environment become more Invisible?

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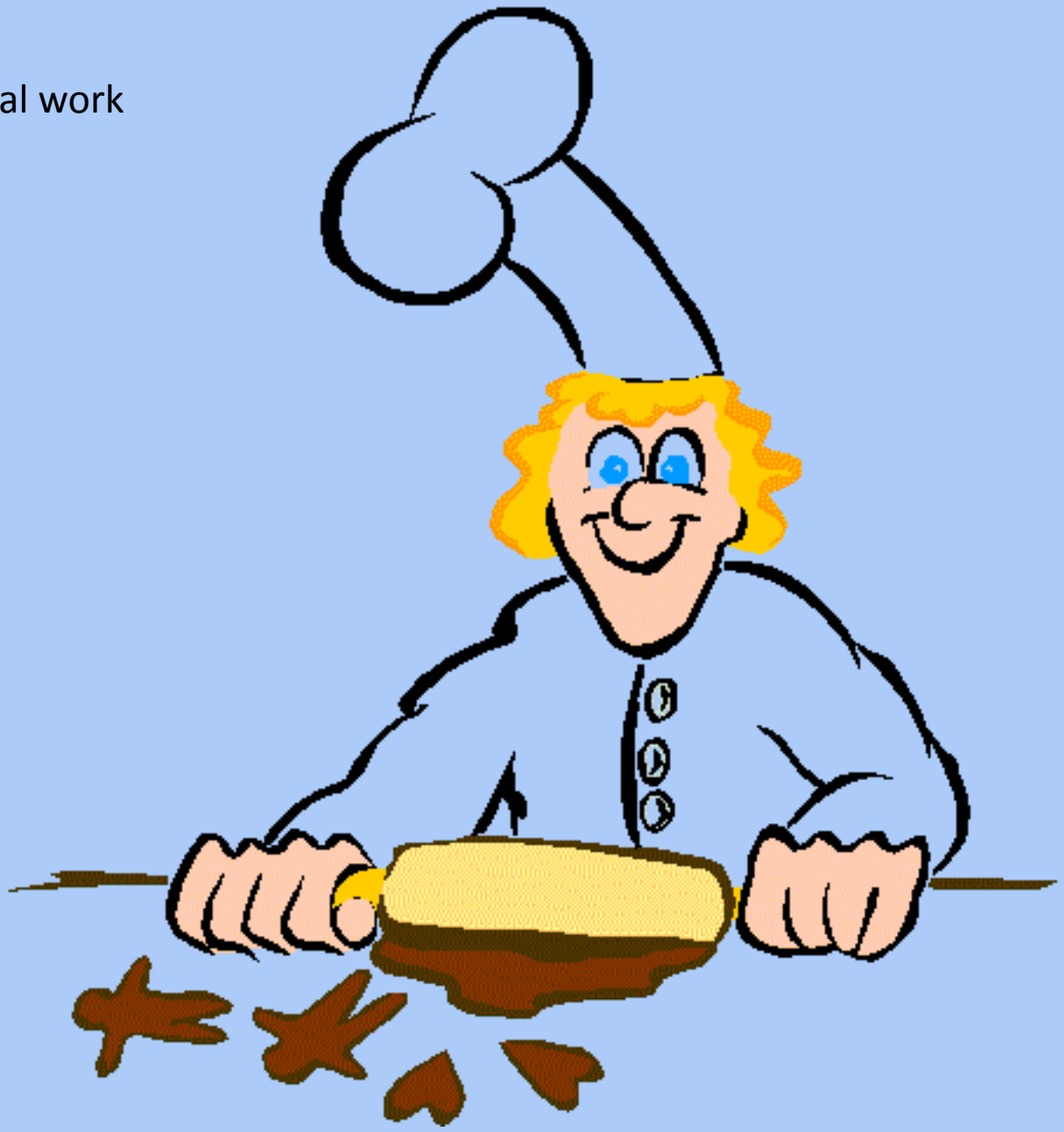
Manual work



Abstraction of the work process: the baker in his/her controlroom

Fictive slide


SAWCO AB

Mental assembly lines?

Guess their work!!

Freelance journalist

Real estate agent

Insurance officer

Salesmen of soaps

Truck coordinator, and so on

How to make the invisible visble

The major changes now and in the future working environment is controlled and determined in relation to the development of information technology at all levels of the society.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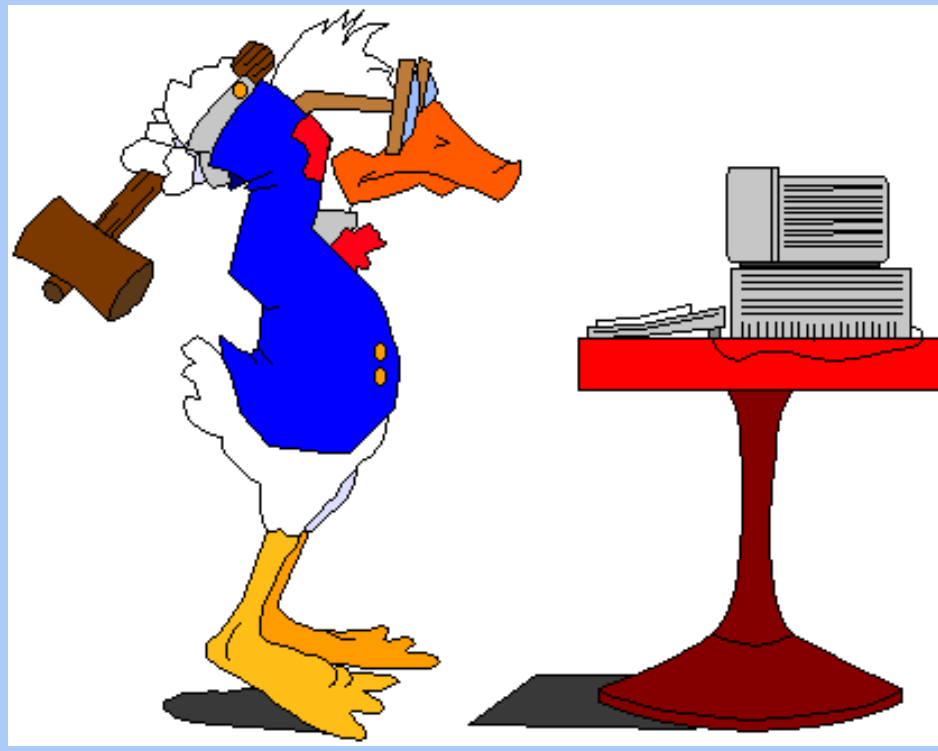
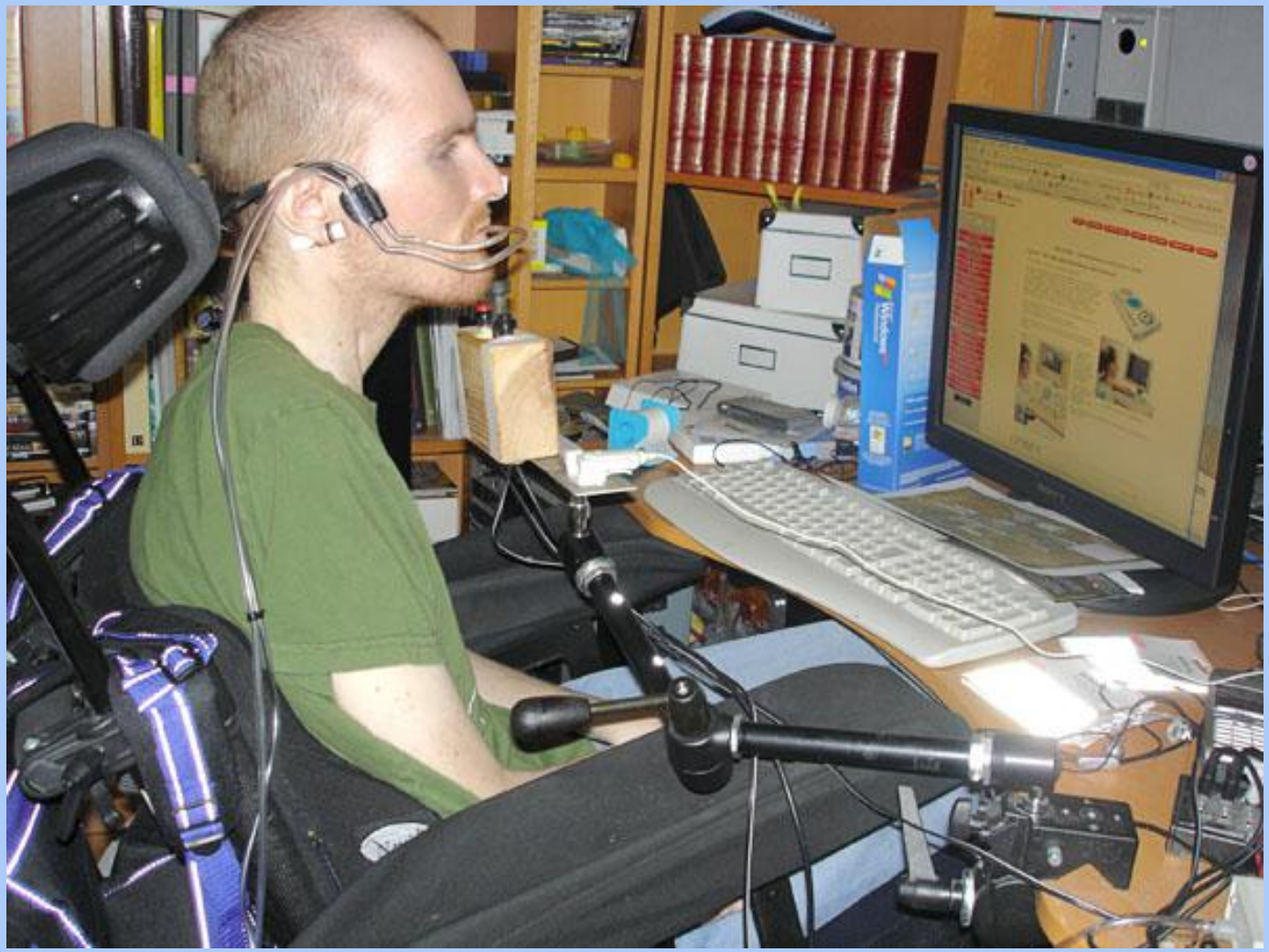


Reciprocal exchange between sensory systems and environmental systems



We need a new vocabolary, new methods to make the invisibly visibly

Viewed from this perspective, I think that technological innovations have not necessarily reduced the amount of 'work' but rather significantly changed the type of work performed by humans.

These innovations did not replace human labour, but introduced deep changes in its environment, which leds to requirements of new cognitive compentences (Dror 2005)

We will not be able to describe the work environment by blunt physical and psychosocial factors. We will need a new vocabulary that describes the work by e.g. declarative, procedural, executiva, memory capacities, implicit / explicit, etc. functions with relation to brain function

Cognitive processes

mental processes like thinking, memory, attention.

Declarative memory

Memory that we can tell or verbalize

Episodic memory

Memory of personal and specific experiences

Short term memory

Memories that is store information a short period 20-30 seconds.

Source memory

Memories regarding circumstances under which they become memorized (a type of episodic memory)

Long-term memory

A memory that is stored permanent as it was stored

Procedural memory

Aquried skills, based on routins of low cognitive compexity

Prospective memory A form of episodic memory, memory of the future. Important for planning.

Semantic memory

Memory of facts.

Priming

Aims at the fact that memory performance can be improved if the subject previously has been exposed to the memory material or related material. Of great help if built in complex work environment

This is what we need to do the invisibly visibly

This is what the inspectors need methods for and knowledge about to be able to inspect in the future

Due to research, new methods and technology
inspectors will to a lesser extent having to visit the workplace to be inspected

Thank you for your attention