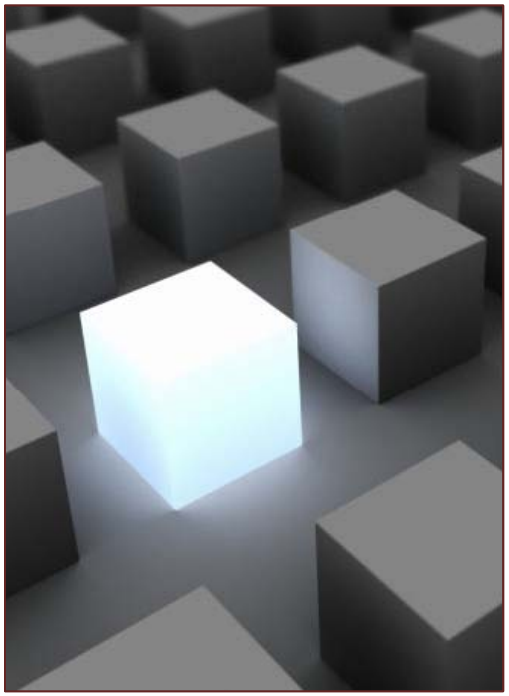
Expertise in planning & estimation

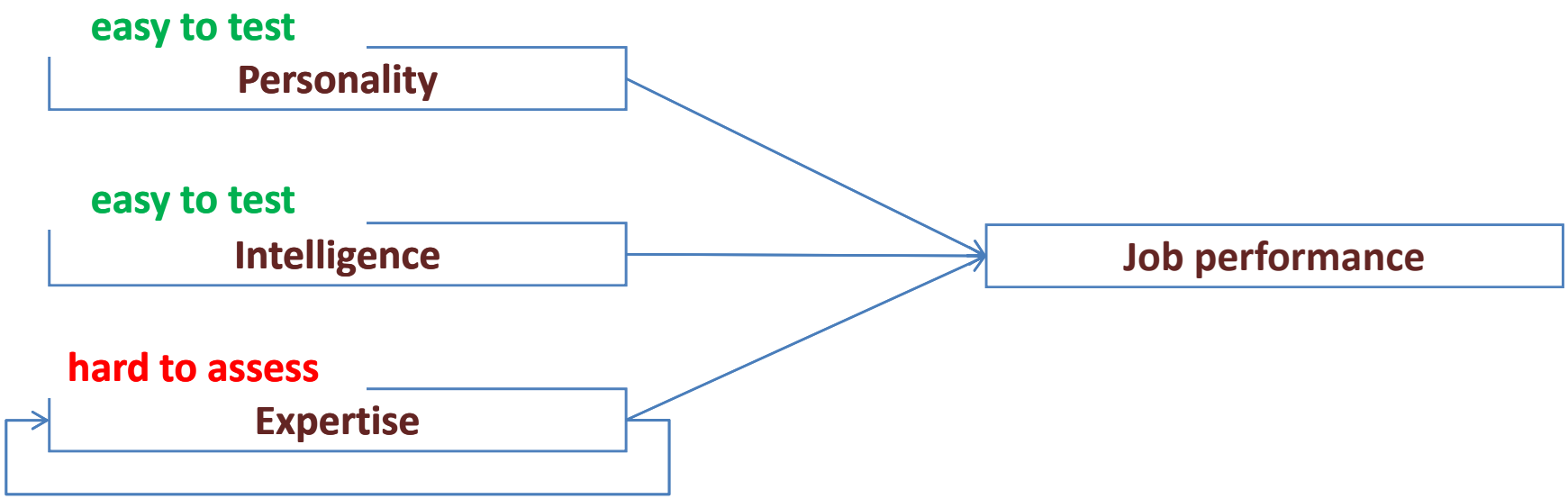
What is it and can one improve it?



Jo Hannay (Simula)

What is expertise?

Individual differences (three central ones):



1. **Personality has, in general, modest predictive power on job performance**

   Peeters et al. 2006, Barrick et al. 2001, Bell 2007, Hannay et al. 2010

2. **Intelligence has some general predictive power, but has most effect in learning situations and entry-level jobs**

   Schmidt et al. 1986, 1988, Campbell et al. 1993

3. **Expertise (job specific) is the best predictor for job performance if you want to test experienced people**

   Ericsson et al. 2005, Schmidt et al. 1986, 1988, Campbell et al. 1993

What is expertise?

Expertise has several aspects/definitions:

A. **More efficient cognitive structures (methods for organizing/retrieving knowledge)**
   - need fMRI machine and or ways to elicit peoples mental models

B. **Better performance on work-sample tasks**
   - need validated tests with many small representative tasks, and ways to measure a persons skill relative to the tasks' difficulty

C. **Extended experience**
   - amount of relevant practice (but what is relevant practice?)

D. **Other people's consensus (your supervisor and peers)**
E. **Your own opinion**

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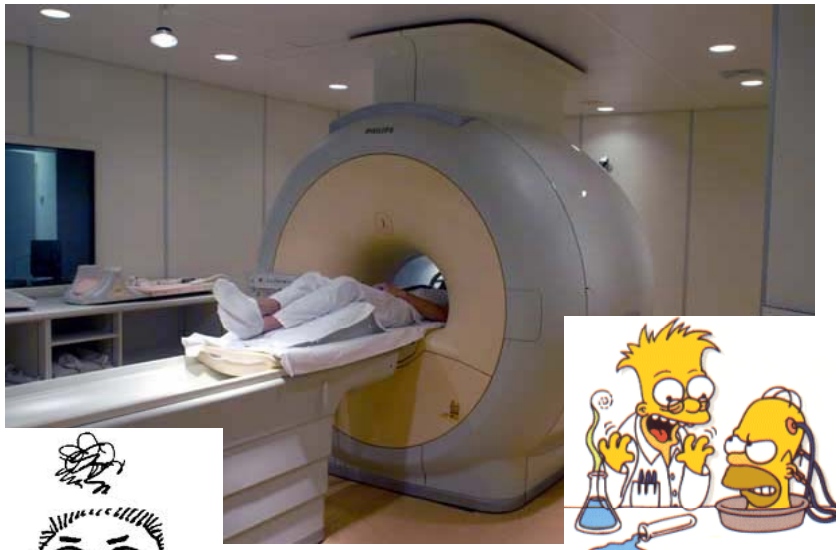

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(A-E) should covary

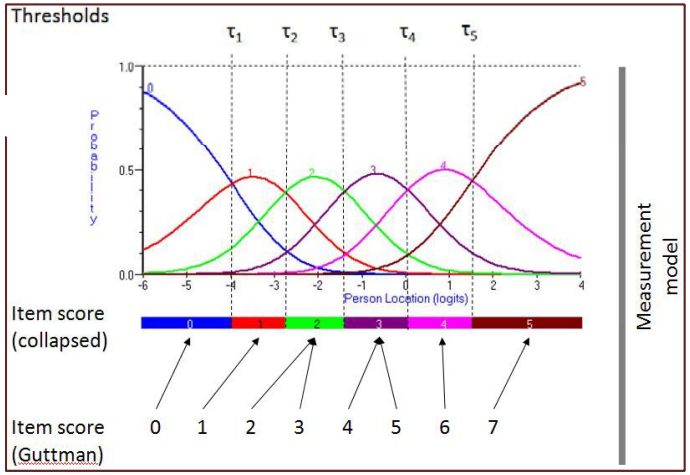
If you know that e.g., C implies A, then one can use C to infer A

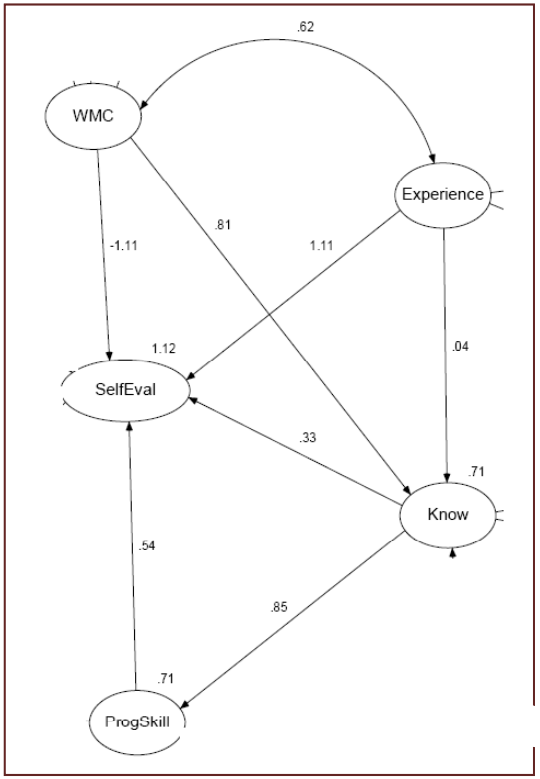
More of A-E should give better job performance

Is it possible to assess expertise?

For programming: We have developed an instrument which measures skill in terms of work sample tasks B.

Bergersen 2010, Bergersen et al. 2011





Bergersen & Gustafsson 2010,

Covaries with A, C, D, E

…and intelligence affects skill (B) indirectly via knowledge

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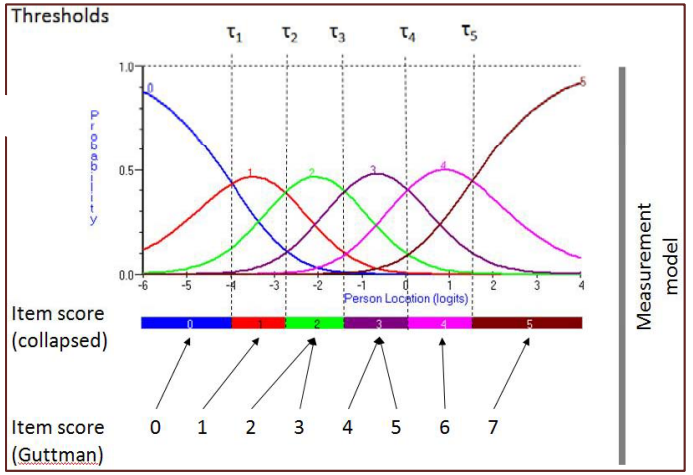
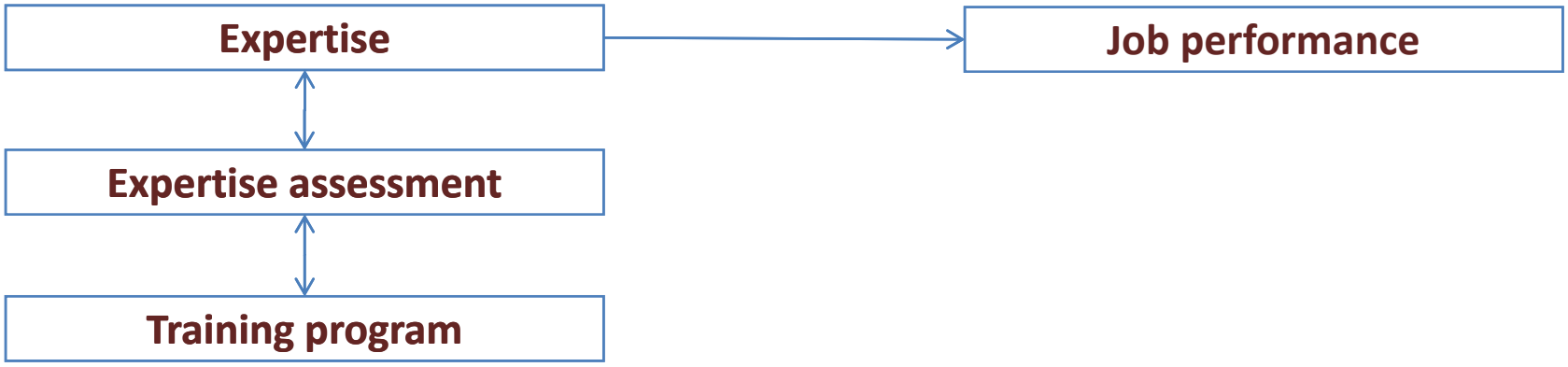




Is it possible to assess expertise?

For estimation???

Moløkken-Østvold, & Jørgensen 2007

Extended experience (C) isn't a reliable predictor for job performance
… learning even with feedback seems to be limited

Gruschke & Jørgensen 2009

We have no way of measuring estimation skill (B)

Many of the mental processes used in estimation (and judgment more generally) are subconscious and robust even when you're made aware of them

Ill-structured tasks: hard to even define successful strategies

Inconsistent tasks: substantially different strategies for solving the task emerge

Consistent tasks: over time, the best performers develop similar strategies

Assessing estimation skill: a long way to go.
Improving estimation skill: -------- " ---------

Assessing estimation skills

Demands that we understand which expertise that is needed for the tasks of estimation and planning.

1) skill in rating amount of work

2) skill in judging uncertainty

4) skill in understanding and choosing risk

3) skill in strategi selection (mean versus analogy)

5) skill in adjusting appropriately according to uncertainty

6) skill in regressing appropriately toward the mean

7) skill in withstanding irrelevant information

8) skill in withstanding anchors

9) skill in concept understanding

Skill in concept understanding

A few central concepts:

Complexity	**(Time and money)**
Story point	**(Time and money)**
Estimate	**(most likely, median, mean?)**
Uncertainty	
Probability distribution	

…

…

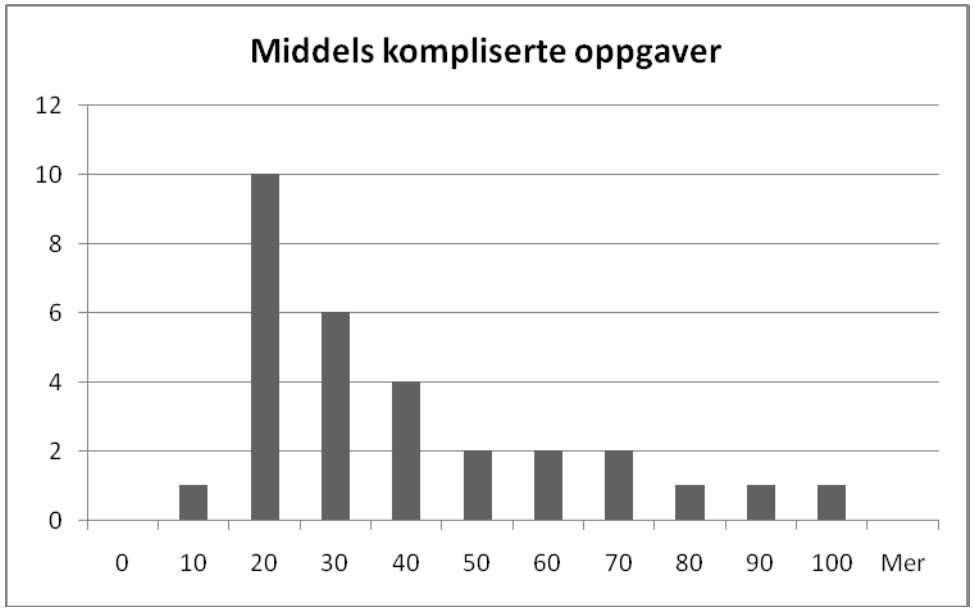
…

Skill in concept understanding

Estimate
Uncertainty
Probability distribution

(most likely, median, mean?)

Oppgave 4



Avdelingen får nå inn en ny oppgave som lederen vurderer til å være av samme kompleksitet som oppgavene i tabellen. **Hvor mange timeverk ville du ha estimert for denne oppgaven basert på de historiske dataene?**

Oppgave 5

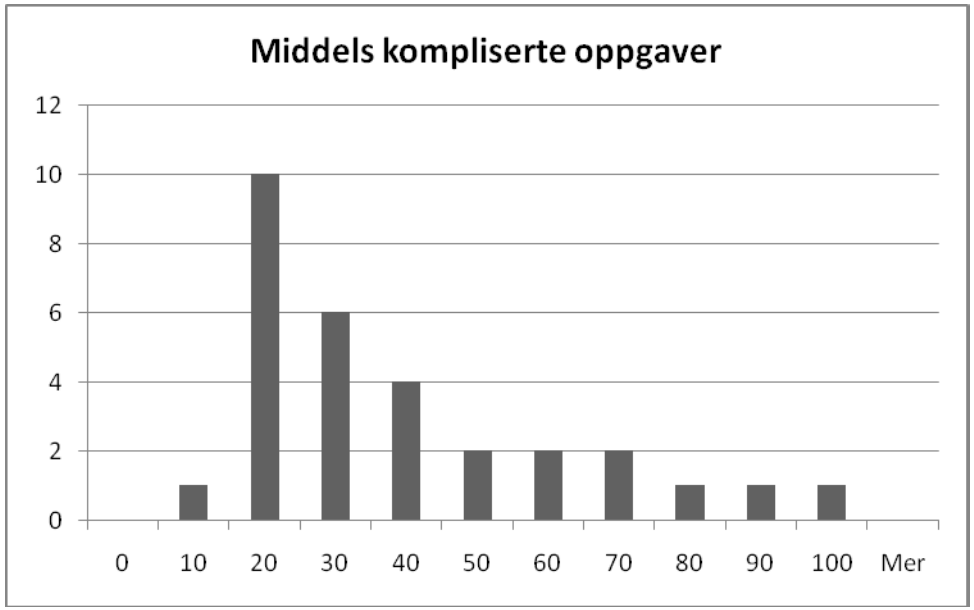
Simula organiserer flere seminarer hvert år. Simula har bedt din bedrift om å utvikle et enkelt web-system (en nettside) for registrering av deltakere til seminarene. Deltakere bør være i stand til å registrere seg på nettet ved å sende sin e-postadresse og en kode som identifiserer seminaret. Den eneste funksjonaliteten i systemet er å lagre e-postadresse og registrering koden i en database. Alle spørringer vil bli gjort manuelt (i sql), og det er ikke behov for noen validering av innsendte data. Det er ingen krav til sikkerhet. Anta at du er kjent med de aktuelle teknologiene og **vil gjøre all utvikling selv.** Du står fritt til å bruke det utviklingsverktøy du vil. **Hvor mange timeverk estimerer du det vil ta for å levere dette systemet?**

Skill in concept understanding

Estimate
Uncertainty
Probability distribution

(most likely, median, mean?)

Oppgave 4



Most likely (20): 6 of you chose this
Median (40): 12 of you chose this
Mean (30): 15 of you chose this

Oppgave 5

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Median: 14 of you chose this

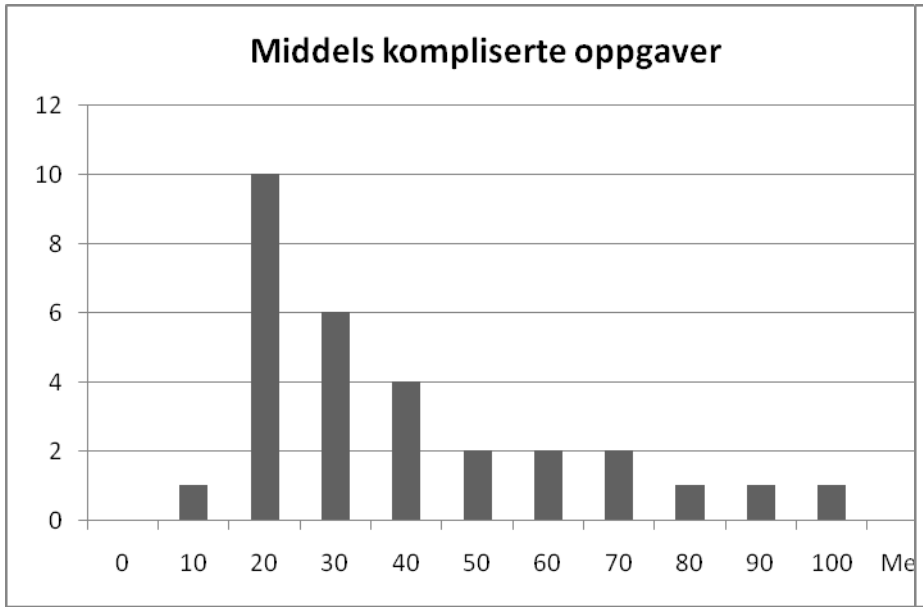
14 of you moved away from median
9 of you moved toward the median

Skill in concept understanding

Estimate
Uncertainty
Probability distribution

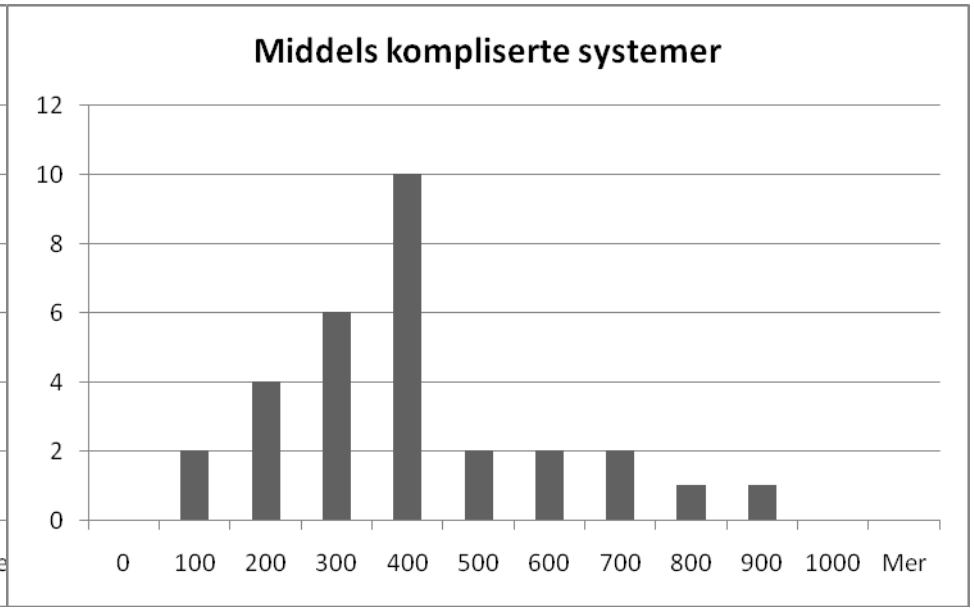
(most likely, median, mean?)

Oppgave 4



Most likely (20): x of you chose this
Median (40): y of you chose this
Mean (30): z of you chose this

Oppgave 12



Most likely = Median = Mean = 400:
y of you chose this

N of you moved away from median
M of you moved toward the median

We must work to get an understanding of the necessary areas for expertise improvement

End