

# *"Far Horizons: Extending the Landscape of Assessment"*

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# In appreciation

- Michigan State University's Office of Medical Education Research and Development (OMERAD)
- Dr. Jack Maatsch
  - Professor OMERAD from 1971 to 1990
  - OMERAD Director from 1980 to 1989
- *“With interest in both theory and application, Jack Maatsch enjoyed and stimulated spirited debate around important issues in the education and assessment of physician competence”*

This presentation is based on a paper that will appear in *Medical Teacher* in 2007 entitled:

*Medical Education and the Maintenance of Incompetence*

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We think of medical education as a process that moves novices from a state of incompetence, to one of competence

This talk explores the idea that education, and in particular assessment processes may actually lead to *incompetence*

# What kind of incompetence?

I am not talking about the rare cases of gross incompetence – sexual abuse, drug addiction, serial killers...but the more grinding and mundane incompetence that harms the quality of patient care and the reputation of the profession itself

# Incompetence as a side-effect

This kind of incompetence is a "side-effect" of medical education

The particular side-effect that occurs is a result of overemphasizing particular models of education and assessment

We all adhere to these models because we believe in them – sociologists call them "discourses"

# What are “discourses”?

- Discourses are ways of seeing the world
- They act like lenses or filters
- They make it possible for us to say some things but not others
- They make it possible to act in certain ways, and to have certain jobs

# For example, there are discourses about madness

Madness as Spiritual  
Possession



Madness as Deviancy



Madness as Medical  
Illness



# If you use the discourse of...

Spiritual Possession you make visible:

*Possessed individuals*, and create a role for  
*Spiritual Healers* working in *religious institutions*

Deviancy you makes visible:

Deviant individuals and create a role for  
Judges/Jailors working in *prisons*

Medical Illness you make visible:

*Mentally Ill* individuals and create a role for  
*Psychiatrists/Psychologists* working in *hospitals*

But as Foucault said, "... we are not dealing with the same madmen"

- Possessed ≠ Deviant ≠ Mentally Ill
- Spiritual Healer ≠ Jailor ≠ Psychiatrist
- Church ≠ Jail ≠ Hospital

Foucault 1969, *The Archaeology of Knowledge*

# What about incompetent doctors?

- Incompetence, like madness, can also been defined in different ways
- Let's look first at some older variations

# A competent doctors in...

## ■ 1700

- Member of a guild
- Carried blade for blood letting
- Emetics for purging to balance humours

## ■ 1900

- Gentleman with a walking stick
- Diagnosed by looking at the tongue, and
- Smelling urine

## ■ 1950

- Man in a white coat
- Talked to husbands about their wife's illness
- Withheld diagnoses from dying patients so they wouldn't worry

## ■ 2007

?

# We are not dealing with the same competent behaviours!

- Blood letting, smelling urine, withholding diagnoses – are clearly incompetent today
- How did these changes occur?
- They occurred because our discourses changed
- What then, are the discourses of competence/incompetence we use today?

# I have been studying our discourses

Over 600 medical education articles:

- Coded for key words, metaphors, shifts in paradigms

25 interviews with key figures in education:

Medical education institutions around the world:

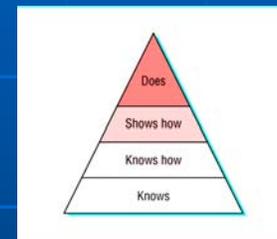
- US, UK, Canada, France, Israel, China, Jordan, Ethiopia, Pakistan, Poland, Japan

# We use at least 4 discourses of competence/incompetence

1. Harrison's Textbook and competence-as-knowledge



2. Miller's Pyramid and competence-as-performance



3. Cronbach's Alpha and competence-as-reliable test score

$$\alpha = \frac{N \cdot \bar{r}}{1 + (N - 1) \cdot \bar{r}}$$

4. Donald Schon and competence-as-reflection



# 1. Harrison's Textbook and competence-as-knowledge



# Competence-as-knowledge



## Key words:

- Facts, foundational knowledge, basic science, first principles, fund of knowledge, classic text books, classic articles, multiple-choice tests
- Teacher role: Lecturer, source of wisdom
- The measure: Knowledge test (MCQ)
- Student role: Memorize, reproduce

# Implications



- Teaching consists of didactic lectures
- Studying involves reading
- Testing involves recall

## The official incompetent

- An individual who does not or cannot memorize or reproduce large amounts of factual data

# Resistance



- After 1960 George Miller and other said that too much emphasis on knowledge created knowledge-smart doctors who had poor inter-personal skills

# Side-effects



*Sitting here studying, I was wondering how important your two lectures are for the exam. I don't see any questions from your lectures on any old exams and wanted to know if your stuff was "testable" this year.*

University of Toronto Medical Student 2000

# Side-effects



*The preoccupation with doing well on standardized tests has literally conditioned the way young people in America think.*

*They have better-developed cognitive abilities to recognize random facts than to construct patterns or think systematically.*

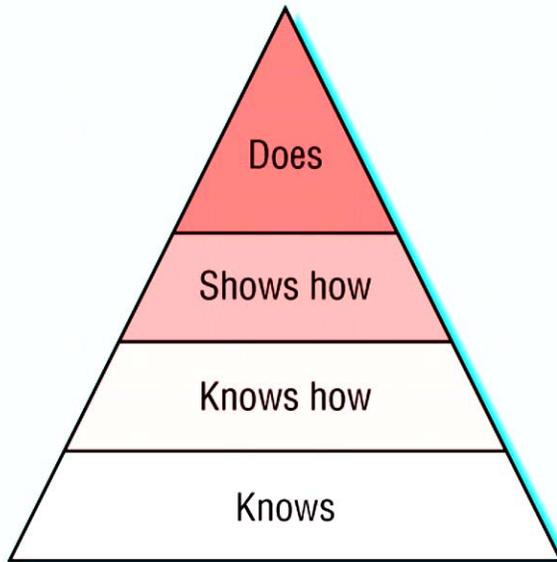
Jacques Barzun, New York Times, 1988

# The Hidden Incompetent

- Poor interpersonal behaviours
- Poor technical abilities

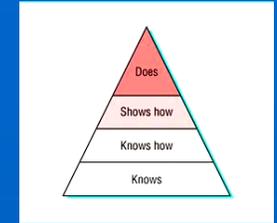
Student: *Madam – do you have higher conjugated or unconjugated bilirubin?*

## 2. Miller's Pyramid and competence-as-performance



van der Vleuten, C. *BMJ* 2000;321:1217-1219

# Competence-as-performance



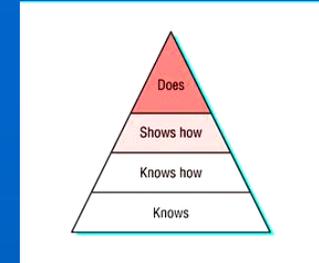
In 1960s the idea of competence-as-performance emerged

*In many places they would ask students to write an essay on the origin of the word shoelace, or give them a multiple choice question on the design of shoelaces or even ask them to describe the steps in tying a shoelace*

*Whereas really the only way of doing it is showing you know how to tie a shoelace*

Ronald Harden 2005

# Competence-as-performance



## Key words:

- simulated patient, programmed patient, patient instructors, feedback, performance, skills, OSCE, multiple observations, stations

- |                  |                        |
|------------------|------------------------|
| ■ Teacher role:  | Teach skills           |
| ■ The measure:   | Performance-based test |
| ■ Students role: | Perform for observers  |

# Implications

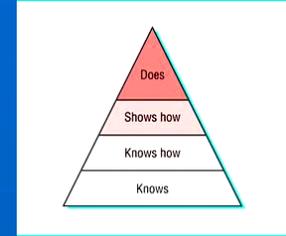


- Teaching involves clinical performances, real and simulated cases
- Performance tests replaced written exams

## The official incompetent:

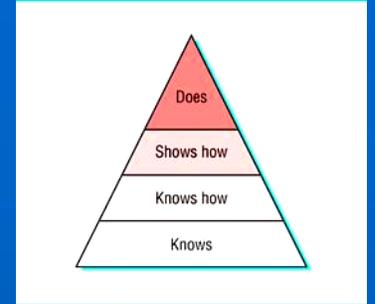
- An individual unable to demonstrate communications, interpersonal, physical examination, or other skills

# Resistance



*In the 1990s, cognitive psychologists and sociologists alike began to have worries about too much emphasis on performance*

# Side-effects



*Cracks started to appear in the pyramid, it seems that knowledge wasn't quite so low down and skills quite so high up as one might have thought*

Geoff Norman 2005

*Relevant knowledge is essential for real-life problems solving...knowledge is highly domain-specific, so is problem solving*

Schurwirth and van der Vleuten 2006

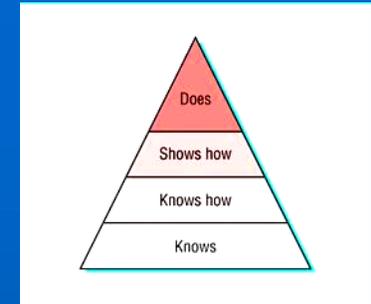
Eva 2005

# Side-effects

*Exclusive reliance on a pedagogical approach of simulation training may be encouraging students to become “simulation doctors” who act out a good relationship with their patients but have no authentic connection with them*

Hanna and Fins 2006

# The Hidden Incompetent



- Poorly integrates knowledge
- Fakes performances

Student: *Oh that must be hard for you...wow that must be hard for you... oh, yes that must be really hard for you*

Patient: *Can you stop saying that?*

### 3. Cronbach's Alpha and competence-as-reliable test score

$$\alpha = \frac{N \cdot \bar{r}}{1 + (N - 1) \cdot \bar{r}}$$

# Competence-as-reliable test score

$$\alpha = \frac{N \cdot \bar{r}}{1 + (N-1) \cdot \bar{r}}$$

After 1980 psychometric reliability of tests became very important

*The significance of the standardized-patient technique in assessment is that it can produce a valid clinical test item to assess performance that has many of the same advantages of the multiple-choice question*

*It is a standardized item, can be given in multiples, and can be scored in reliable and valid ways.*

Howard Barrows 1993

# Competence-as-reliable test score

$$\alpha = \frac{N \cdot \bar{r}}{1 + (N-1) \cdot \bar{r}}$$

## Key words

- reliability, validity, generalizability, data, psychometrician, candidate, checklist, item-banking, cut-point, standardization

- |                 |                         |
|-----------------|-------------------------|
| ■ Teacher role: | Exam preparation        |
| ■ The Measure:  | Standardized checklists |
| ■ Student role: | Maximizing data-points  |

# Implications

## Asks about:

Onset of pain	✓
Site	✓
Nature	✓
Duration	✓
Exacerbation	✓
Relieving	✓
Nausea	✓
Vomiting	✓
Shortness of breath	✓
Diarrhea	✓
Blood	✓
Stool colour	✓

- Teaching shifted to examination preparation and standardized scenarios
- Goal of testing was to reduce all sources of variance and maximize reliability of scores
- Feedback often vanished for reasons of examination security

## The official incompetent

- The individual who could not score highly on checklists in standardized simulations

# Resistance

$$\alpha = \frac{N \cdot \bar{r}}{1 + (N-1) \cdot \bar{r}}$$

*We dismiss variance between observers as error because we start from the assumption that the universe is homogenous, where in fact the more logical conclusion would have been that the universe is more variant.*

*Assessment should be fair, honest and defensible...but the strict operationalisation of these values is – in our humble opinion – currently of limited value.*

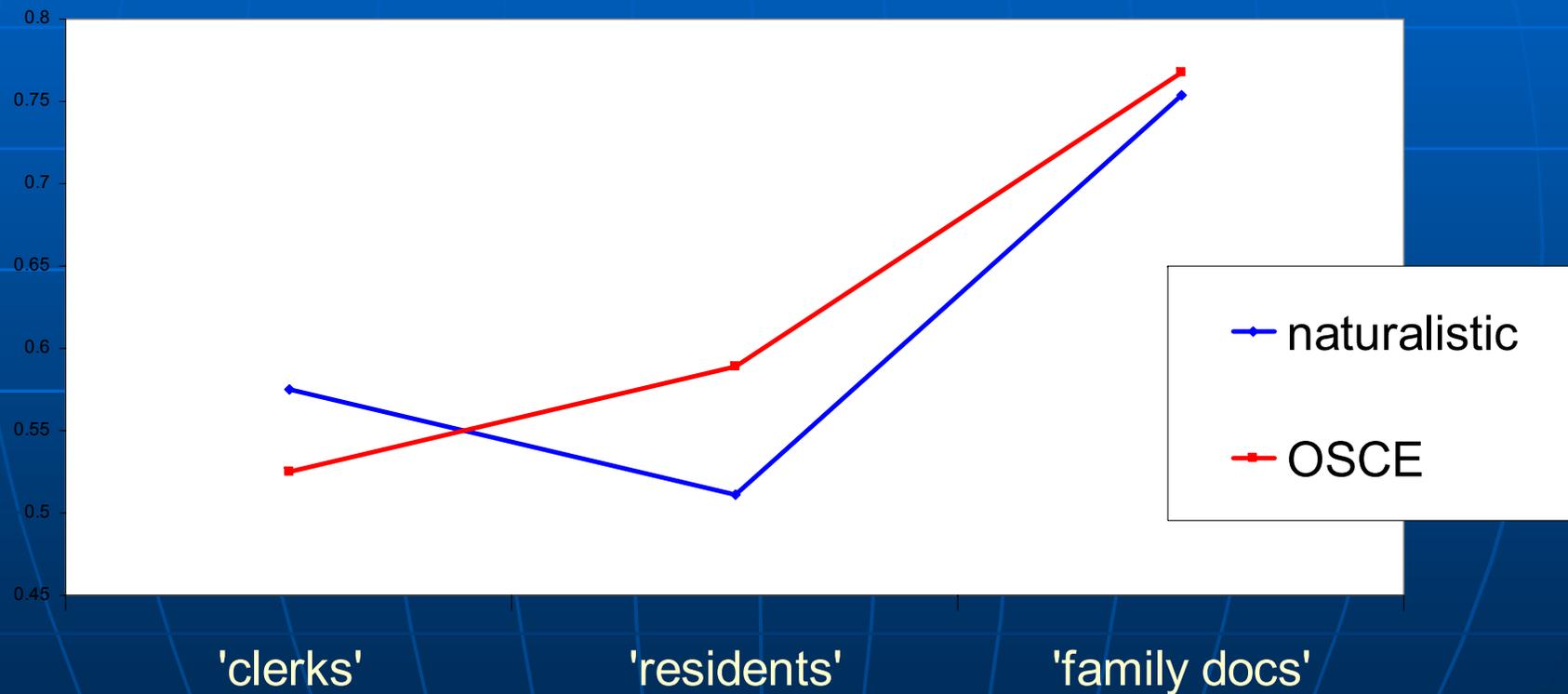
# Side-effects: OSCE checklists do not capture increasing levels of expertise



Hodges B, Regehr G, McNaughton N, Tiberius R, Hanson M. (1999)  
*Academic Medicine*

# Global ratings can capture expertise

Figure 1: Global Ratings



# Students adapt their behaviour to the system of evaluation

- 57 clinical clerks randomly assigned to 2 groups in a 10 station OSCE
- Group 1 told that scores were based on checklists
- Group 2 told that performance would be rated using global ratings assessing overall competence
- All candidates scored by blinded MD raters using both checklists and global ratings
- Significant interaction: rating form by orientation ( $F_{1,55}=5.5, p<0.05$ )
  - checklist oriented group had higher checklist scores
  - Process oriented group had higher global scores

Herold-McIlroy et al 2002

# Side-effects

$$\alpha = \frac{N \cdot \bar{r}}{1 + (N-1) \cdot \bar{r}}$$

*I have heard enough anecdotes about the shotgun behaviour induced by checklists to shift the burden of proof onto the advocates of this strategy*

*Geoff Norman 2005*

# The Hidden Incompetent

$$\alpha = \frac{N \cdot \bar{r}}{1 + (N-1) \cdot \bar{r}}$$

- Shot gun interviews
- Lacks use of pattern recognition, integration, synthesis

Student: *You keep saying to take time to be nice, listen to the patient and make a synthesis of the problem, but if we don't ask as many questions as possible we will not pass the examination*

## 4. Schon and the discourse of reflection



# Competence-as-reflection



Since the mid 1990s, the work of Donald Schon has become an antidote to standardized testing, emphasizing the idea that competence requires internal reflection and self-direction

*The concept of learner as a mere processor of information has been replaced by the image of a self-motivated, self-directed problem solver*

Ontario Ministry of Education 1980

# Competence-as-reflection



## Key words:

- reflection, self-directed learning, learning contracts, portfolios, adult learner

- |                 |                        |
|-----------------|------------------------|
| ■ Teacher role: | Guide/Mentor/Confessor |
| ■ The measure:  | Portfolio              |
| ■ Student role: | Reflector              |

# Implications



- At the school level: use of dossiers, portfolios, reflective/confessional activities
- At national levels: required self-assessments and submission of learning portfolios

## **The official incompetent**

- Individual who cannot produce a convincing analysis of his/her strengths and weaknesses

# Resistance



*It is impossible to make people understand their ignorance, for it requires knowledge to perceive it; and therefore, he that can perceive it, hath it not"*

Jeremy Taylor

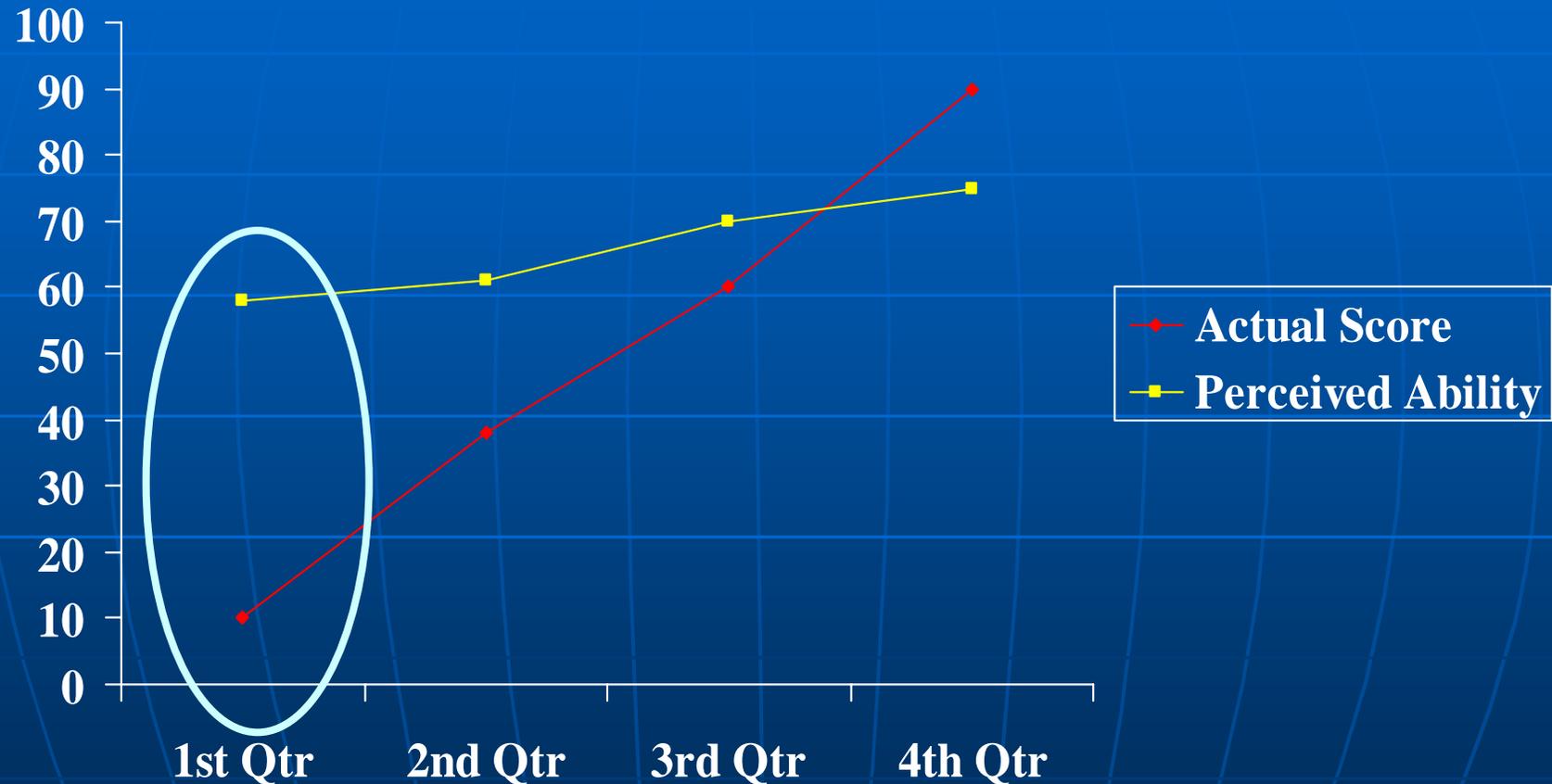
# Side-effects



- Analysis of 17 studies comparing doctors' self-assessments against and objective, external review
- *There is a subset of clinicians who appear, either by training or personality, unable to judge themselves*

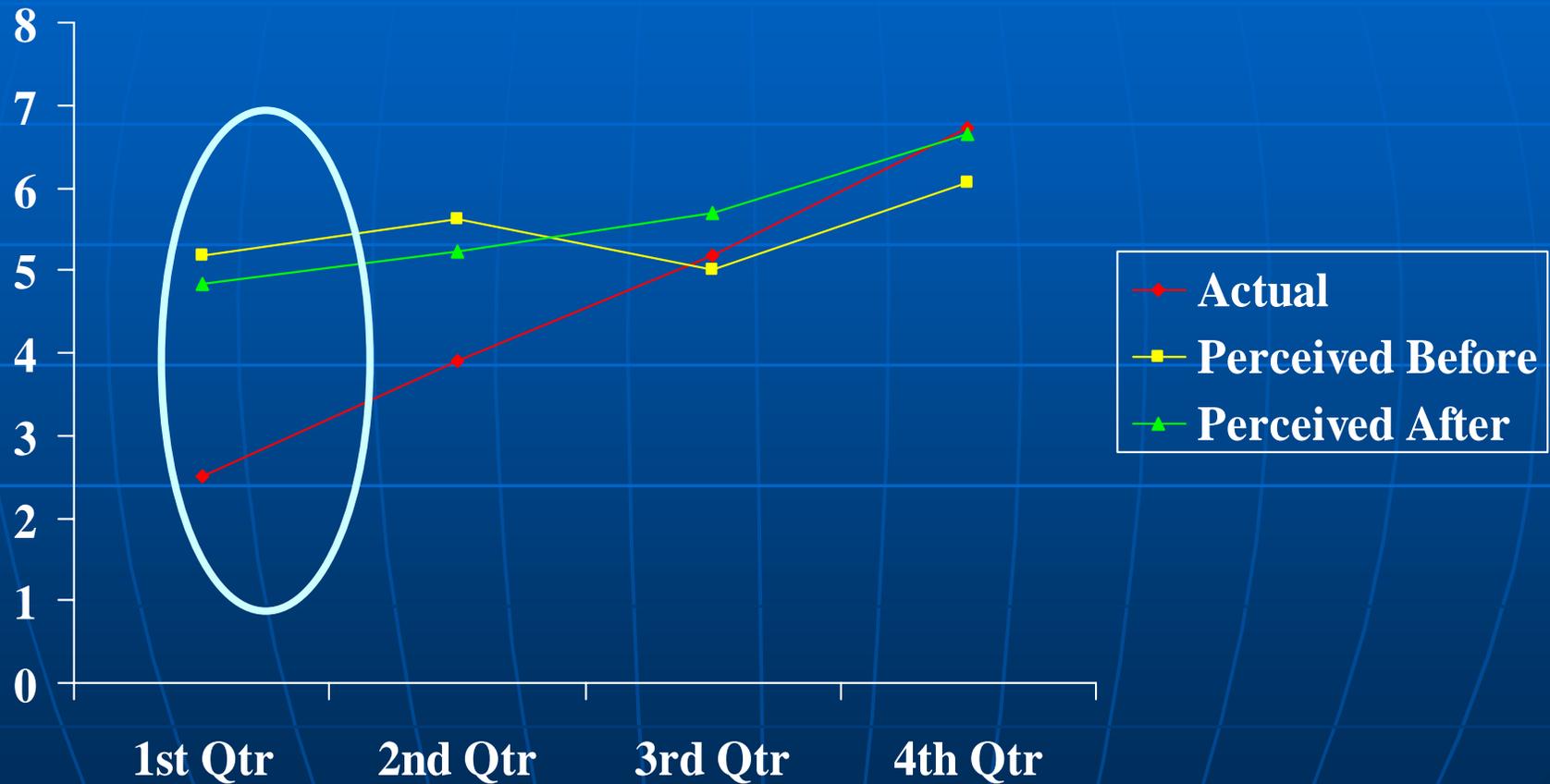
Davis JAMA 2006

# Side-effects: Unskilled and Unaware



Kruger and Dunning. *Journal of Personality and Social Psychology*, 1999

# Handling a case of child abuse



Hodges, Martin, Regehr *Academic Medicine* 2001

# Side-effects



*Reflective practice provides the mechanism whereby nurses internalize the new professional ethos of self-government...*

*Meanwhile, regulators appear quite unconcerned about the lack of coherence between what is being monitored 'at a distance' and the actual professional knowledge (needed) to function skilfully and competently*

Nelson and Purkis *Nursing Inquiry* 2004

# The Hidden Incompetent



- Individual who cannot identify deficits
- Individual who cannot direct own learning
- Individual who *appears* to reflect but doesn't have adequate knowledge or skills

*Teacher: Can you reflect on your weaknesses?*

*Student: Sometimes I am too committed*

# Summary

- What we choose to emphasize and to assess in medical education drives behaviour to such an extent that it can actually create forms of incompetence
- Like medical treatments, we must pay more attention to the *side-effects* of medical education and assessment methods
- Probably only a minority of our students will have these side-effects. Many will be quite competent professionals after graduation, but for the rest...

# Balance the positive and negative effects of educational discourses

## Don't teach / test pure knowledge

- integrate knowledge with skills early and often

## Don't teach / test 'general skills'

- Integrate skills with their contextual knowledge

## Limit use of standardized scenarios / measures

- Foster expert forms of thinking and embrace variance

## Implement reflection carefully

- Don't use self-directed learning without establishing the capacity for self-assessment
- Don't let competence assessment rest on reflection alone

# Chose measurement instruments carefully

Don't use psychometrically rigid measures only

- Performance-based assessments should include global ratings, particular at higher levels of expertise

“Global ratings” are not all the same

- Use a rubric like Hunters' classification (5 levels from “atomistic” to “holistic”) to chose the *kind* of global rating you want

Triangulate multiple perspectives

- Gather ratings from SPs and MD, but also other professionals and peers
- Consider the type of rating most appropriate for each

Don't let test “security” trump feedback

# Push the limits of education research

Don't be confined by traditional psychometric concepts of validity

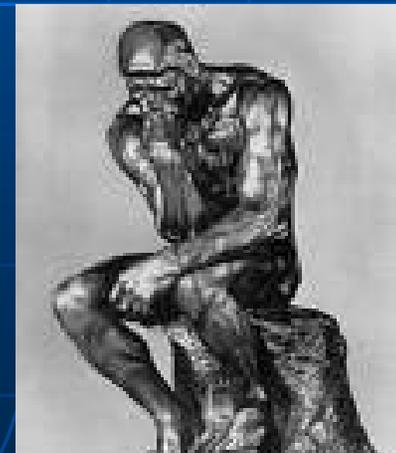
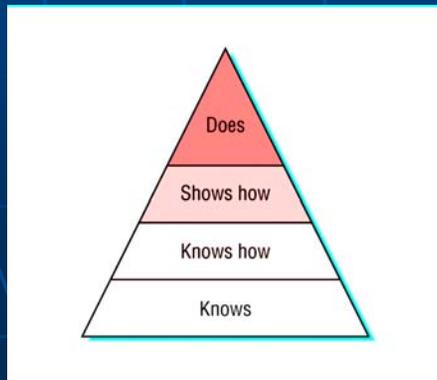
- Explore the "ecological" validity of assessments through studies of impact on student behaviour and thinking
- Consider the negative, "deforming" side-effects as well as the positive outcomes
- Use qualitative methods as well as traditional validity statistics to study validity
- Reflect on how the discourses and models we chose are linked to important historical, political and economic factors

Most importantly each of use should ask:  
What does *my* discourse make possible?



$$\alpha = \frac{N \cdot \bar{r}}{1 + (N - 1) \cdot \bar{r}}$$

*Thank you!*  
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