Using judgement analysis to research experts' clinical decision making and develop effective training for novices.

DECISION MAKING IN NEUROLOGICAL REHABILITATION
Friday 15th November 2013, 8.30 am – 5.15 pm
Lecture Theatre, 33 Queen Square, London

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Why research clinical decision making?

- To identify thinking behind best practice in order to maximise effectiveness of clinical practice.
This is done in multiple fields of research

- Fire fighting
- Aviation
- Sports
- Farming
- Clinical
Novice (Sinclair 2003)

- Slow, deliberative
- No experience, so dependent on theory to guide practice
- Not able to prioritize
- Distracted by irrelevant information
Expert (Sinclair 2003)

- Quick and intuitive with solutions even with ill-structured problems.
Daniel Kahneman is an internationally renowned psychologist.

In recognition of his groundbreaking work on human judgment and decision-making, Kahneman received the 2002 Nobel Prize.

In this lecture he explores the idea of intuition.

you tube Kaheman lecture on Intuition

Start 7.30 minutes for examples
So how does the expert think differently?

- Perception and search strategy
- Pattern recognition
Perception and search strategy

attention test
Typical Eye Movements in Reading a Mammogram

Micro-calcification cluster

Expert

Novice

Images: Dr Krupinski
Pattern recognition
PARIS IN THE SPRING
Hypothetico-deductive reasoning

- Cue acquisition
- Hypothesis generation
- Cue interpretation
- Hypothesis evaluation
So what do judgement analysis researchers study?
AHP studies using judgement analysis


AHP studies using judgement analysis


http://referralprioritisation.wordpress.com/
Harries et al. research using judgement analysis

Researched decision making on the detection and prevention of elder financial abuse of professionals working in social care, health and banking in the United Kingdom.

Results have been used to developed training resources which are effective in improving professionals' ability to identify elder financial abuse, and know what sort of action should be taken.

http://www.elderfinancialabuse.co.uk/

Harries et al. (2008-2012) NDA funding £300K. ESRC follow-on grant £100K.
Developing decision training tools to enhance the ability of professionals to detect and prevent financial elder abuse.
Current studies using judgement analysis


Judgement analysis study example
Referral prioritisation: UK, Australia, NZ

- Sample from UK

40 experienced occupational therapists prioritised 90 referral scenarios by marking a cross along a visual analogue scale (see sample referral). 30 repeat referrals were added to test consistency.
Results

- Occupational therapists’ prioritisation policies were statistically modelled ($R^2 = 82.4\%$).

- Cluster analysis to identify subgroups
Experts' weightings given to referral information when prioritising referrals

<table>
<thead>
<tr>
<th>Reason</th>
<th>Mean Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis</td>
<td>0.50</td>
</tr>
<tr>
<td>Violence</td>
<td>0.07</td>
</tr>
<tr>
<td>Referral Reason</td>
<td>0.63</td>
</tr>
</tbody>
</table>
Priority given to differing diagnoses

<table>
<thead>
<tr>
<th>types of diagnosis</th>
<th>mean weightings</th>
</tr>
</thead>
<tbody>
<tr>
<td>schiz.</td>
<td>7</td>
</tr>
<tr>
<td>dep.</td>
<td>5</td>
</tr>
<tr>
<td>anx &amp; dep.</td>
<td>4</td>
</tr>
<tr>
<td>OCN</td>
<td>4</td>
</tr>
<tr>
<td>anxiety</td>
<td>3</td>
</tr>
</tbody>
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Educating the students

1. Prioritise set of referrals
2. Train students in expert policy
3. Prioritise new set of referrals
4. Analyse students prioritisation policies before and after training
Analysis

- Ratings (mark on line between low and high priority)
- Policy: cue weights (e.g. diagnosis v violence)
- Cue content (e.g. depression v schizophrenia)
- G, Rs and C
- Student consensus
- Consistency (intra rater reliability)
Mean correlation of students’ ratings and expert ratings (achievement)

<table>
<thead>
<tr>
<th>subject</th>
<th>pre-training</th>
<th>post-training</th>
</tr>
</thead>
<tbody>
<tr>
<td>37 Students</td>
<td>$r = 0.23$</td>
<td>$r = 0.70$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$p &lt; 0.01$</td>
</tr>
</tbody>
</table>
student 3: judgement policy before training with expert policy

weightings

referral information

violence
support
history
living sit.
Experts' weightings given to referral information when prioritising referrals

- **Reason for referral**: 0.5
- **Diagnosis**: 0.3
- **Violence**: 0.1

Referral information

Mean weightings

0.6
0.5
0.4
0.3
0.2
0.1
0.0

Reason for referral
Diagnosis
Violence
student 3: policy after training

referral information

reason for referral

diagnosis

violence

weightings
Comparison of ratings given by expert and pre-trained students for each of the levels of the 'diagnosis' cue.
Comparison of ratings given by experts and post trained students for each of the levels of the 'diagnosis' cue

- Schizophrenia
- Depression
- Anxiety & Depression
- OCN
- Anxiety

Levels of the 'diagnosis' cue

Mean ratings given to referrals.
Cochran Weiss Shanteau (CWS)

- CWS = discrimination inconsistency

Higher score - more expert
Lower score - less expert
Expert 37, CWS = 46.73
Student 11 Pre-training, CWS = 1.43
Student 11 Post-training, CWS = 79.48
Questions?

- References can be found at

  http://www.brunel.ac.uk/shssc/people/occupational-therapy/priscilla-harries