Labelling difficulties:  
the curious case of EPs and evidence-based practice  

Dr Dan O’Hare
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The plan for today...

- Why this topic
- EBP from an EP perspective
- Other ways of thinking about EBP
- My research
- Discussion
- Implications
Why this topic

• Writing essays
• Psychology in the pub
• Star Trek
• EPs any closer to having the answer?
Why this topic

• Writing essays
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• EPs any closer to having the answer?
EPs ‘medicalising’ EBP

The rationale for EBP is that professional practice must be based on evidence of what works (rather than opinion or belief) and that evidence comes from research. Research is seen as varying in quality and the best type of research, the “gold standard”, is randomised controlled trials (RCTs).
(Fox, 2011, pg. 326)

• EPs do not have the time to keep up to date with the burgeoning volume of published research
• There is a lack of evidence
• EPs lack the skills to critically and systematically appraise research
• Research is contradictory
The practice of evidence-based medicine means integrating individual *clinical expertise* with the best available external clinical *evidence from systematic research*
Conscientious, explicit, and judicious use of...

- Evaluated external research evidence
- Evidence from the local context
- Practitioner expertise and judgement
- Perspectives of those affected by the decision
Thesis questions and hypothesis

1. What are EPs’ (trainees, main grade, senior and principal) current **attitudes** towards, and **understanding** of, EBP?

2. What do EPs consider the most **valuable types of evidence** when making decisions?

3. Are EPs well enough ‘**equipped**’ to practice in an evidence-based way?

4. What are the **barriers and facilitators** to EBP in EP practice?

5. What is the **future direction** for EPs vis-à-vis EBP

**Hypothesis**: EP’s will need **assistance to practice** in a more evidence-based way.
Once Upon a Time
Watching TV is related to mathematics ability

Besides viewing the 'numbers' section of Channel 4's Countdown on a regular basis, one could imagine that watching television does little to enhance mathematical ability. Recent research findings from a top British Cognitive Neuroscience Institute could be about to dispel that myth.

The research team set out to establish if and how data obtained through numerous brain scan technologies (from a variety of unrelated research experiments) could be used to analyse the output images. The software automatically filtering 'noise' and only highlights significant increases in activity of fMRI cross-section scans on an online database.

One significant finding centred on activation in the prefrontal cortex for those undertaking arithmetic tasks and those that undertook creative tasks. This supports the idea of "cells that fire together wire together". "...based on the site specificity of the activation data, watching TV can improve mathematical skills, but this effect is contingent on the ability to switch off visual input from the screen and focus on the sounds of the show." Thus, educators may be able to combine the two activities in a more effective way in the future.

Meditation enhances creative thought

New brain scanning technologies have enabled cognitive neuroscientists to explore mental phenomenon in a way previously thought impossible. Positron emission tomography (PET) and functional magnetic resonance imaging (fMRI) are two such technologies that researchers can use to corroborate or debunk a range of neuro-urban myths. A subject of debate regarding whether 'doing it' actually makes a difference or whether it is simply a self-fulfilling prophecy of sorts.

Now, thanks to high-resolution brain imaging technology, researchers can see brain activity between the practice of meditation and increased performance on creative tasks. Meditation practices and their corresponding neural correlates were also discovered in frequency fMRI scans (meditation practices included Mindfulness, Zazen). 48 undergraduate students were asked to perform a simple creative task scanner (the students were asked to think of as many uses for a paperclip as possible). The researchers areas of the cerebrum in both condition did not differ, except the 'seat of creativity' of the researchers' cortical activation and creative thinking during the task. Undertaking meditation had a significant effect on cognitive demand, and performance. Two of three groups were recruited to undertake the paperclip creative task, one group were given introductory meditation sessions prior to completing the task.

The take home finding is that it was these participants that performed significantly better than chance. This may be down to finding that those undertaken meditation, showed significantly more frontal cortex activity than their control condition counterparts.

Playing video games benefits attention

Several social and education commentators have linked the modern young persons inability to focus, to the increasing proliferation of console and computer gaming. The reasoning is that computer game stimuli change so rapidly; they reinforce the desire for novelty away from the screen. New research from Germany however could cast doubt on this assumption.

Researchers took an anti-normative view regarding video games and postulated that far from obstructing attentional processes, video games may indeed benefit attention (there are numerous anecdotes about young people being "glued" to computer screens for hours on end). Seventy-two 16-23 year olds underwent PET scans whilst playing the "best-selling" console game, Portal. Each participant was required to play the game for at least twenty minutes so that researchers could acquire a longitudinal scan of brain activity.

They found that whilst playing the computer game, and controlling for visual and memory activation, most activity was found in the sub-parietal cortex which has been shown to mediate visuo-spatial attention. With these results, the researchers employed a relatively recent neurotechnology, Transcranial Magnetic Stimulation (TMS). Briefly, TMS uses electromagnets to rapidly alter polarisation of neurons in specific areas of the brain, leading to bursts of neuronal activity with little or no discomfort. Thirty-six of the original seventy-two 16-23 year olds underwent TMS, site specific to where the researchers saw most sub-parietal activity in the computer game brain scan, whilst completing a pattern recognition task (the other thirty six participants acted as a control group).

The researchers found that those participants that underwent TMS experienced attentional benefits, as measured by completing the task more rapidly and accurately, less blinking, and a higher proportion of correct answers within set time limits. So it seems playing video games benefits attention after all.
1. The article was well written
2. The title was a good description of the results
3. The scientific reasoning of the article made sense
Phase 1 Findings

Now, thanks to high-resolution brain imaging technology, researchers have established a direct link between the practice of meditation and increased performance on creative thought tasks. A range of meditation practices and their corresponding neural correlates were assessed using high spatial frequency/MRI scans (meditation practices included Mindfulness, Zazen and Qi Gong). Alongside this, 48 undergraduate students were asked to perform a simple creative thought task whilst in an MRI scanner (the students were asked to think of as many uses for a paperclip as possible).

The researchers found that surprisingly, large areas of the cerebral cortex displayed activation in both conditions, more specifically in the frontal lobe area, which has been postulated to be the 'seat of creativity'. In a second experiment, the researchers hypothesised that if similar cortical activation occurred during meditation and creative thinking tasks, then perhaps undertaking meditation prior to 'creative cognitive demand' would lead to better performance. Two new cohorts of undergraduate students were recruited to undertake the paperclip creativity task, crucially though, one group were given introductory meditation sessions prior to completing the creativity task.

From obstructing attentional processes, video games may indeed benefit attention (there are numerous anecdotes about young people being 'glued' to computer screens for hours on end). Seventy-two 16-23 year olds underwent PET scans whilst playing the 'best-selling' console game, Portal. Each participant was required to play the game for at least twenty minutes so that researchers could acquire a longitudinal scan of brain activity.

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Phase 1 Findings

Watching TV is related to mathematics ability

Besides viewing the “numbers” section of Channel 4’s Countdown as a regular basis, one cannot imagine that watching television does little to enhance mathematical ability. Recent research findings from a top British Cognitive Neuroscience Institute could be about to dispel that myth.

The research team set out to establish if any unexpected results had arisen from the Task Procedure and to review the ad-hoc method of analysing the output image. The aim and only highlight of the methods section can be summarised in the following way:

One significant finding that there was a significantly higher rate of uncorrected arithmetic errors in the TV group compared to the control group. "Watching TV can improve your maths score!" - Dr. Jane Smith

Meditation enhances creative thought

Now brain scanning techniques have enabled cognitive neuroscientists to explore mental processes in a way previously thought impossible. From functional magnetic resonance imaging (fMRI) and functional magnetic resonance imaging (fMRI) to the development of neuro-activated methods, researchers have developed a range of neuro-activation methods to explore the potential for meditation to enhance creative thought. A range of meditation practices and their corresponding frequency have been identified as having a positive impact on creative thought. 


Playing video games benefits attention

Severe social and education commentators have linked the rising young persons’ ability to focus, to the increasing proliferation of console and computer gaming. The reasoning is that computer games stimulate children, so they reinforce the desire for novelty away from the screen. Research from Germany, however, could cast doubt on this assumption.

Researchers took an anti-social approach regarding video games and postulated that far from obstructing attention processes, video games may indeed benefit attention. There are numerous anecdotes about young people being “ glued” to computer screens for hours on end. In the two 16-23 year-olds, the most effective game on the “best selling” console game, Portal. Each participant was required to play the game for at least twenty minutes so that researchers could acquire a longitudinal scan of brain activity.

They found that whilst playing the computer game and controlling for visual and memory activation, moss activity was found in the sub-parietal cortex which has been shown to modulate visual-spatial attention. With these results, the researchers employed a relatively recent neuro technology, Transcranial Magnetic Stimulation (TMS). Briefly, TMS uses electromagnetic fields to rapidly alter polarization of neurons in specific areas of the brain, leading to bursts of neuronal activity with little or no damage. Thirty-one of the original seventeen 16-23 year-olds underwent TMS, site specific to a region where the researchers found most sub-parietal activity in the computer game brain scan, whilst completing a pattern recognition task (the other thirty-six participants acted as a control group).

The researchers found that those participants that underwent TMS experienced attentional benefits, as measured by completing the task more rapidly and accurately, less blinking, and a higher proportion of correct answers within set time limits. So it seems playing video games benefits attention after all.
ATTITUDE IS EVERYTHING
The Evidence-based practice attitude scale

- Total EBPAS Score
- Appeal
- Requirements
- Openness
- Divergence
Phase 2 findings: masters and doctoral
Phase 2 findings: trainee and qualified
Phase 3 findings: focused ethnography

- Standardised Assessment
- Observing others
- Focused ethnography
- Talking to others
- Using numbers to show change
- Discussion about research
Phase 3 findings: interviews

EPs and Evidence-based practice

- Sources of evidence
- Conflict
- Doing criticality
- Research
- The 'research assumption'
- Communities of Evidence-based practice
Basically I look at it in terms of research literature, or what I can gleam from the research literature about the latest evidence, the latest ways to approach situations or the latest in research about how best to approach the role of the EP
(Dave)

Slowly but surely I have been trying to fit a realistic and operable model of EBP in to my world
(Dave)
Sources of evidence

- Direct sources
- What works and observed change
- Ethical consideration
• Epistemology
• EPs doing research
• Trainees
• Barriers to using research
• Critical reading
I don’t necessarily... I’m absolutely rubbish when it comes to that sort of more...that level of analysis.

(Dave)

Its what we take trainees on for... we take them on more for action based research, we take them on to evaluate our nurture project, to evaluate what we’ve been doing

(Fiona)
Communities of Evidence-based practice

- Peer interaction
- Isolation
- (Self) evaluation
I think it’s about discussion; it’s about relationships, I think it’s about what you find out in relationships with these people you discuss things with. (Fiona)

I’m the only EP that comes in to the office so I am quite isolated in terms of having support and just seeing other EPs and chatting and so supervision becomes even more crucial because everybody works at home so you don’t get those moments where you just come back in to the office and “you’re not gonna believe what’s just happened to me” (Dave)
Explicitly considered evidence

Implicitly considered evidence
EPs and EBP right now

- Practitioner expertise and judgement
- Evaluated external research evidence
- Evidence from the local context
- Evidence from people affected by decisions
Evidence-based educational psychology practice (EBEPP)

- Ethical considerations
  - Evaluated external research evidence
  - Evidence from the local context
  - Evidence of those affected by the decisions
  - Practitioner expertise and judgement

Communities of practice
EBP: a cognitive dissonance

EPs have little access to literature about EBP. EP literature constructs a narrow definition of EBP.

- Awareness of poor research skills
- Generally positive attitudes to EBP
- Supply and demand of impact measures

Resulting belief: EBP is not useful or applicable to EP practice
Why a cognitive dissonance?
Fox’s suggestion:

Fox (2011): Reactance theory -

ONLY if EBP is designed to curtail, limit, repress or restrict the options, expertise and judgement of a practitioner
EBP: back to the start

Without clinical expertise, practice risks becoming tyrannised by evidence, for even excellent external evidence may be inapplicable to or inappropriate for an individual patient. Without current best evidence, practice risks becoming rapidly out of date, to the detriment of patients. (Sackett et al, 1996, pg. 71)

External clinical evidence can inform, but can never replace, individual clinical expertise, and it is this expertise that decides whether the external evidence applies to the individual patient at all and, if so, how it should be integrated into a clinical decision. (Sackett et al, 1996, pg. 71)
Why a cognitive dissonance - my suggestion: The inoculation effect

**Supportive Defence**
Arguments congruent with the misunderstanding that EBP is practice based-on research, and why this does not work

**Inoculation defence**
Weakened versions of arguments that promote the utility of research in EBP (ignoring other types of evidence)
Implications for day to day practice

• Models of EBP
• Practice-based evidence...as opposed to what?
• Cognitive bias training
• Research training – publication bias
  o Critical of the Hierarchy of Research Evidence
• Research Access
Strategic and professional implications

- EBP and problem solving frameworks
- BPS and MOLIDs
- Training courses: universities and local authorities
- LA reappraisal of what evidence counts
- Evaluation?
- Reconcile cognitive dissonance
Please tweet about the Conference using #decptep16