



THE UNIVERSITY OF
BUCKINGHAM



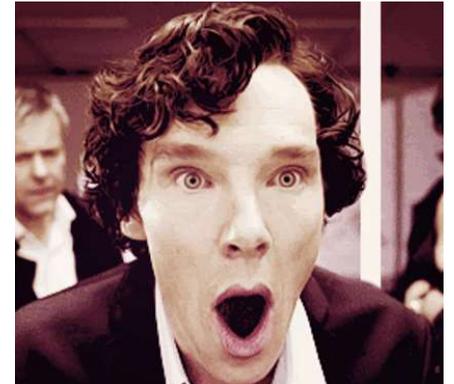
Exploring Insight

... and how Cryptic
Crosswords might
help

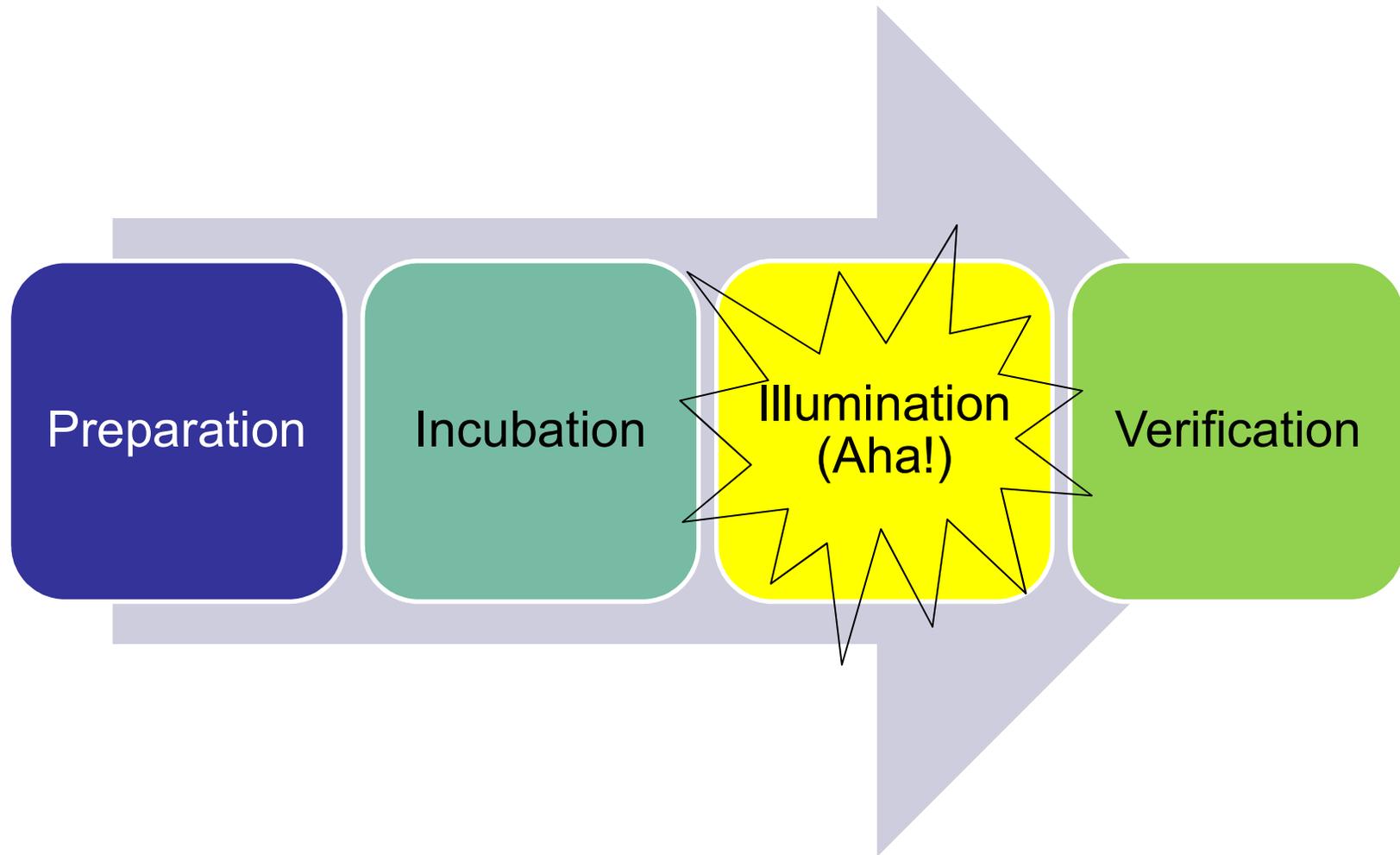
Dr Kathryn Friedlander
Presentation to the Uo3A
Sept 2018

5 Key Features of Insight? (Danek et al, 2014)

- **Suddenness**
 - flash of inspiration ('light switch', 'penny drops')
- **Surprise**
 - eyes widen
 - answer came from nowhere
 - no apparent route to the answer
 - you cannot explain the reasoning that got you there
 - No feeling of 'getting warmer'
- **Affective response ('Happiness')**
 - pleasurable 'kick' (Aha!)
 - sickening moment of realisation (Uh-oh!)
- **Certainty**
 - you are quite certain that you are right (and you probably are)
- **Follows 'Impasse'**

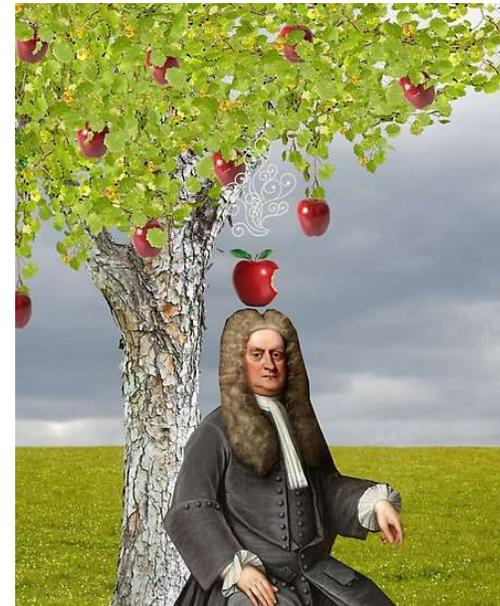


The Creative Process – several stages?



Wallas (1926)

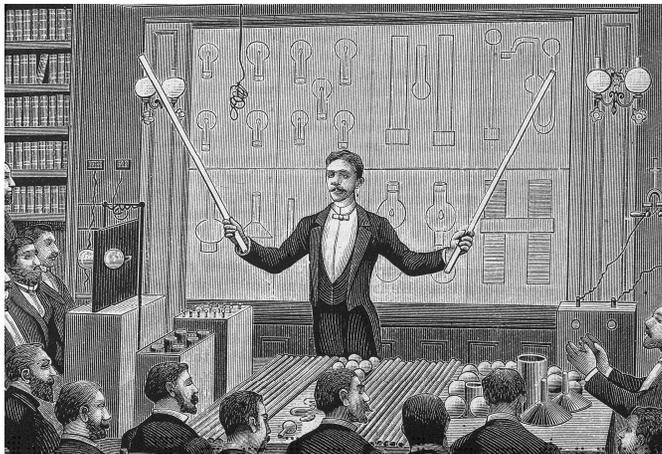
Why do we care?



Archimedes

Newton

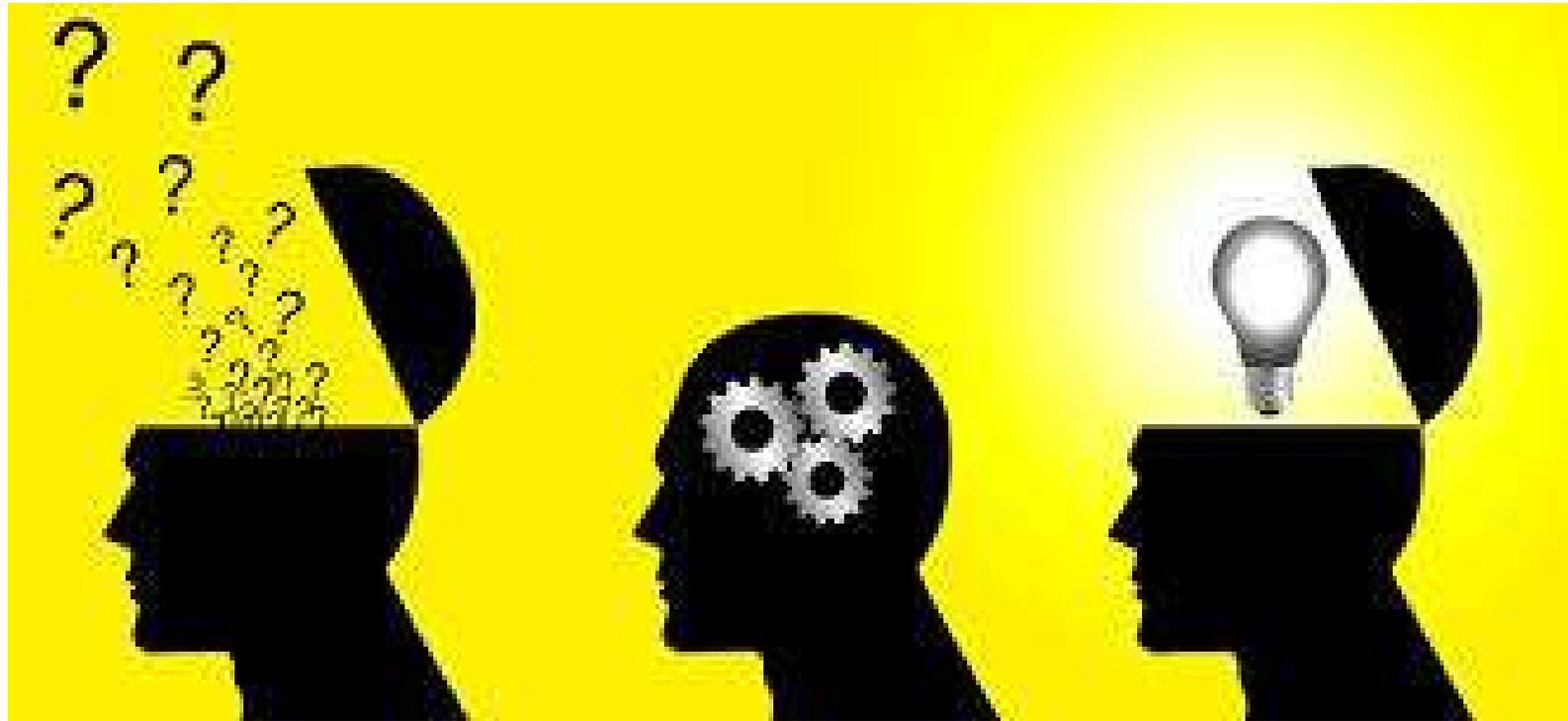
Tesla...



Representational Change Theory

- Reformulation of the problem
 - realising that you were looking at it the wrong way
 - incorrect application of prior knowledge prevents insight
 - perseveration upon existing thought structures
 - previously acquired approaches/strategies
 - » a *reproductive* process
 - needs *innovative* thought
 - Reject existing approach
 - Recombine information in novel ways, with no constraints
 - therefore it is a creative process
 - “Thinking Outside the Box”

The Problem with Insight Moments

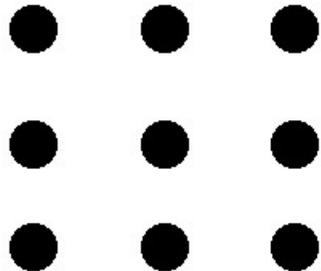


What thought processes are happening?

Is it 'special'?

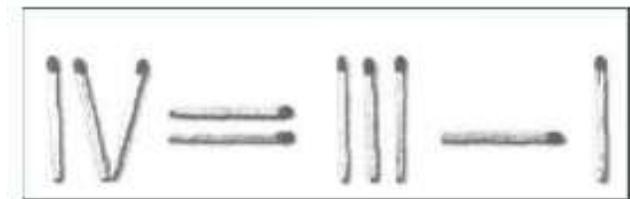
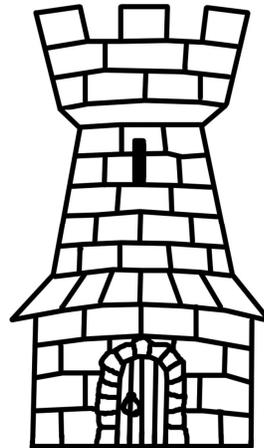
Or 'business as usual'?

Insight problems ...



The "nine dots" puzzle

The goal of the puzzle is to link all 9 dots using four straight lines or less, without lifting the pen.



Knoblich

Which single word can be associated with all three of these words?

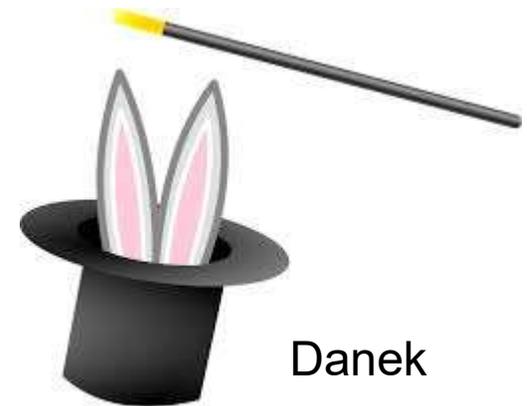
HOUSE APPLE FAMILY

If there is no response for 60 seconds the computer will generate a new item

poPPd

MacGregor & Cunningham

RAT puzzle:
Bowden & Jung-Beeman



Danek

The Problem with Insight Problems ...

- Well-rehearsed limitations
 - Pool of material is limited
 - Known to the general public
 - Can't be certain participants are naïve
 - Leads to discarded trials
 - Low solution rates
 - Classic puzzles – particularly difficult
 - Magic tricks (~ 30%, even after excluding complete non-solvers)
 - RAT – depends on the puzzle; very 'American'

Insight Moments: How you feel does matter

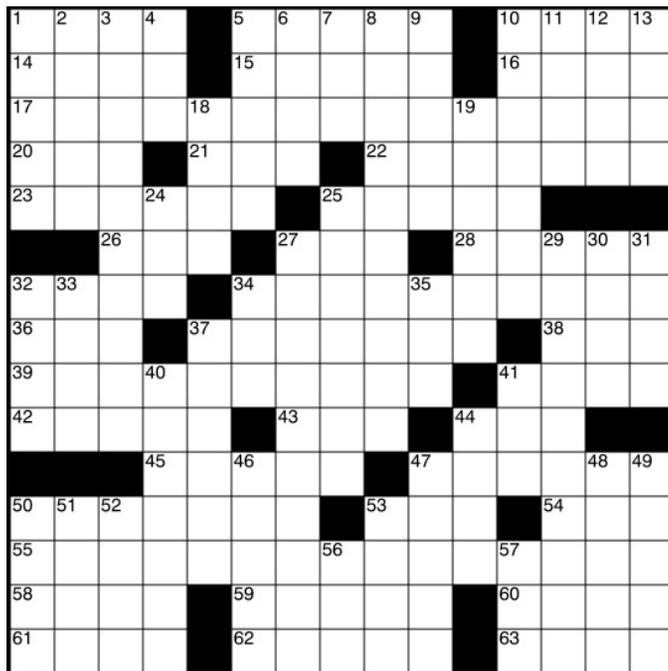
- Even when we solve...
 - Do we always get an insight moment
 - With ‘insight puzzles’?
- It is insight if
 - the solution appears out of nowhere
 - with certainty that you are right
 - AHA!!!!!!
- It is not insight if you set about solving the problem logically
 - by weighing up solutions
 - and making steady logical process towards it
 - No AHA!!!!!!

How can cryptic crosswords help?

- Hundreds of puzzles written each week
 - We have limitless material (commission)
 - Participants guaranteed not to have solved clues
- Typically solved in around 30mins-1hr
 - 26-42 clues in standard puzzle
 - 1-2mins per clue
 - Some people sub-10mins for entire puzzle!
 - Good solution rates
- Misdirection is quite deliberate
 - The intention is to set a red herring
 - Entraps into a false reading of the clue
 - Forces restructuring of understanding, to make progress
 - Constraint relaxation about the purpose of clue components
 - ‘Representational Change Theory’

What is a cryptic crossword?

- What it isn't.....



This is an American straight-definition crossword

- And it isn't.....

A fruit (5)
(APPLE, MANGO, GUAVA, BERRY....)

Stripy Horse (5)
Z _ _ _ A

These are 'straight-definition'
(synonym-only) clues

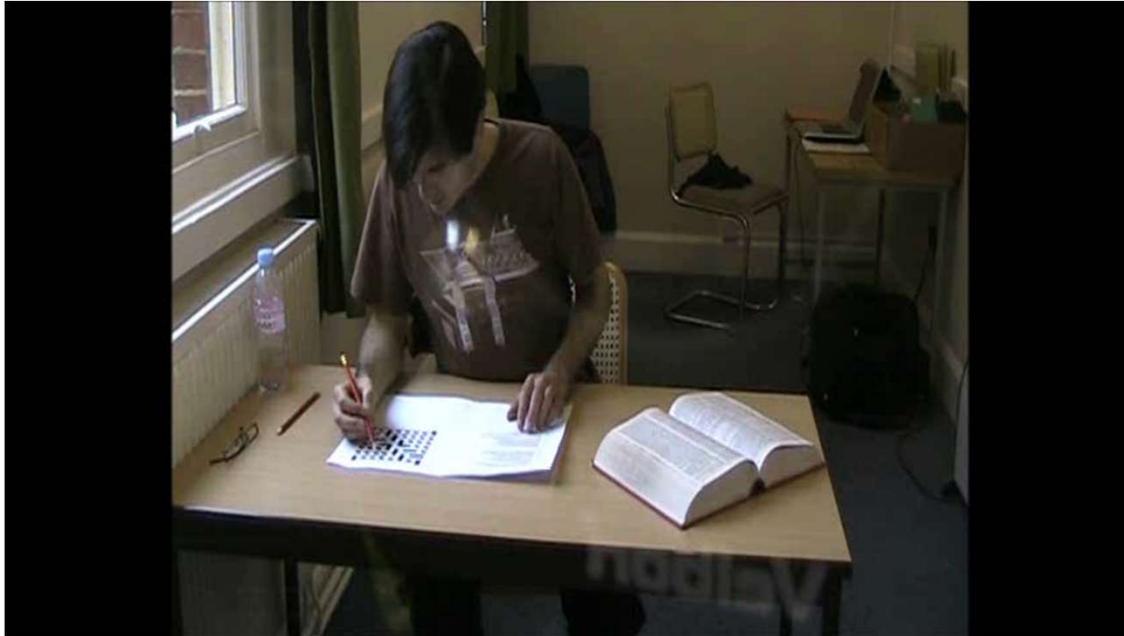
- 'coffee-break' crosswords.

Cryptic clues: Seeing misdirection in action

- 5d:
 - ‘Stop cracking things used in cooking programmes’ (7)
- AGENDAS
 - END (=stop)
 - splitting (‘cracking’)
 - ‘things used in cooking’ (=AGAS)
 - Gives AG-END-AS (programmes)

Take from a lab-based trial of crossword solvers at U of Buckingham

The misdirection is very effective!



**Self-imposed
constraint
prevents
solution... even
though this
participant is a
competition-level
speed-solver**

“Um...5d ‘*Stop cracking things used in cooking programmes*’...I don’t watch cooking programmes...um...stop cracking ... things ... um... cracking things ...what do you crack? Eggs... um...”

Miscellaneous nature of cryptic clues

- Cryptic crosswords use many different devices
 - Double-definitions: remote association search
 - Savings book (7)
 - ‘RESERVE’
 - Very like RAT puzzles (‘end/line/lock’: dead’)
 - Rebus-like constructions
 - ‘Player with one leg?’ (4)
 - IPOD (like a TRIPOD, but just 1)
 - Riddle-like/joke clues
 - Discovered why electrical equipment was dangerous? (9)
 - UNEARTHED
- We could compare outcomes
 - With other insight puzzles
 - Between device types within the crossword

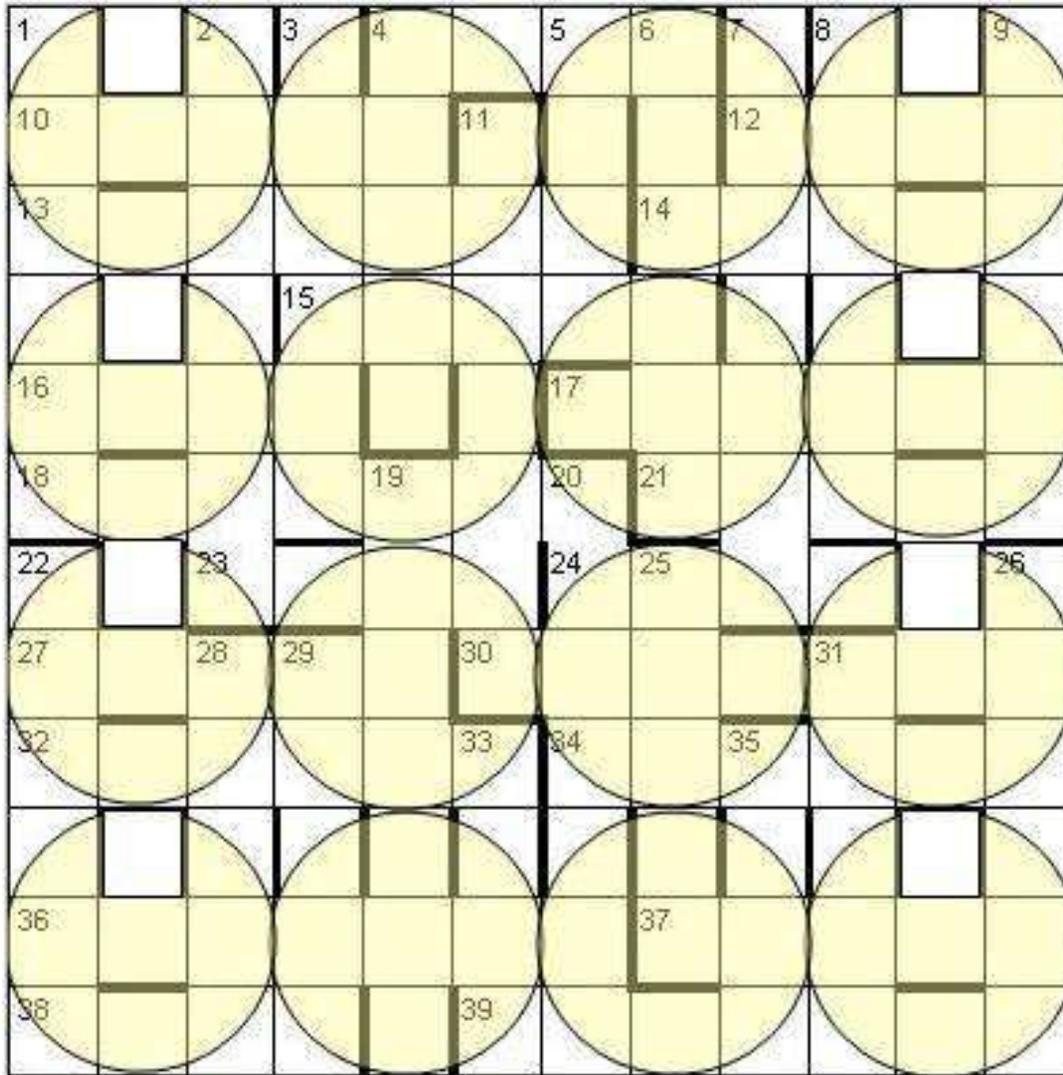
Expertise in cryptic crossword solving

- Cryptic crossword solving is a niche skill
 - With an existing pool of
 - highly expert solvers vs hobbyist solvers
- There is much that might be gained
 - From studying experts at work on insight puzzles
 - May elucidate mechanisms of how insight is arrived at
 - Are there individual differences in this ability?
 - Other insight studies are always of naïve populations
 - There are no RAT experts
 - Or ‘Matchstick maths’ experts

Are we sure they are insight puzzles?

- Yes – from our large survey
 - Participants n=805
 - Friedlander & Fine (2016)
- ‘Why do you solve crosswords?’
 - ‘I enjoy the ‘penny-drop’ moment when I crack a good clue/theme’
 - top rated answer out of 26 suggestions
 - ‘Solving well-written clues gives me a buzz - it makes me smile or laugh out loud’
 - >65% rated 4 or 5 (highest)
 - Nearly 95% of solvers agreed that setting the crossword aside for a while helped to resolve periods of impasse (=incubation)
- The crossword community has its own ‘Eureka’ term
 - ‘Penny-Dropping Moment’
 - ‘PDM’

Listener 4038: 'Playtime' by Samuel



Find a message hidden in extra solution letters which weren't entered in the grid

Highlight a name, two quotations and a thematic phrase

Listener 4038: 'Playtime' by Samuel



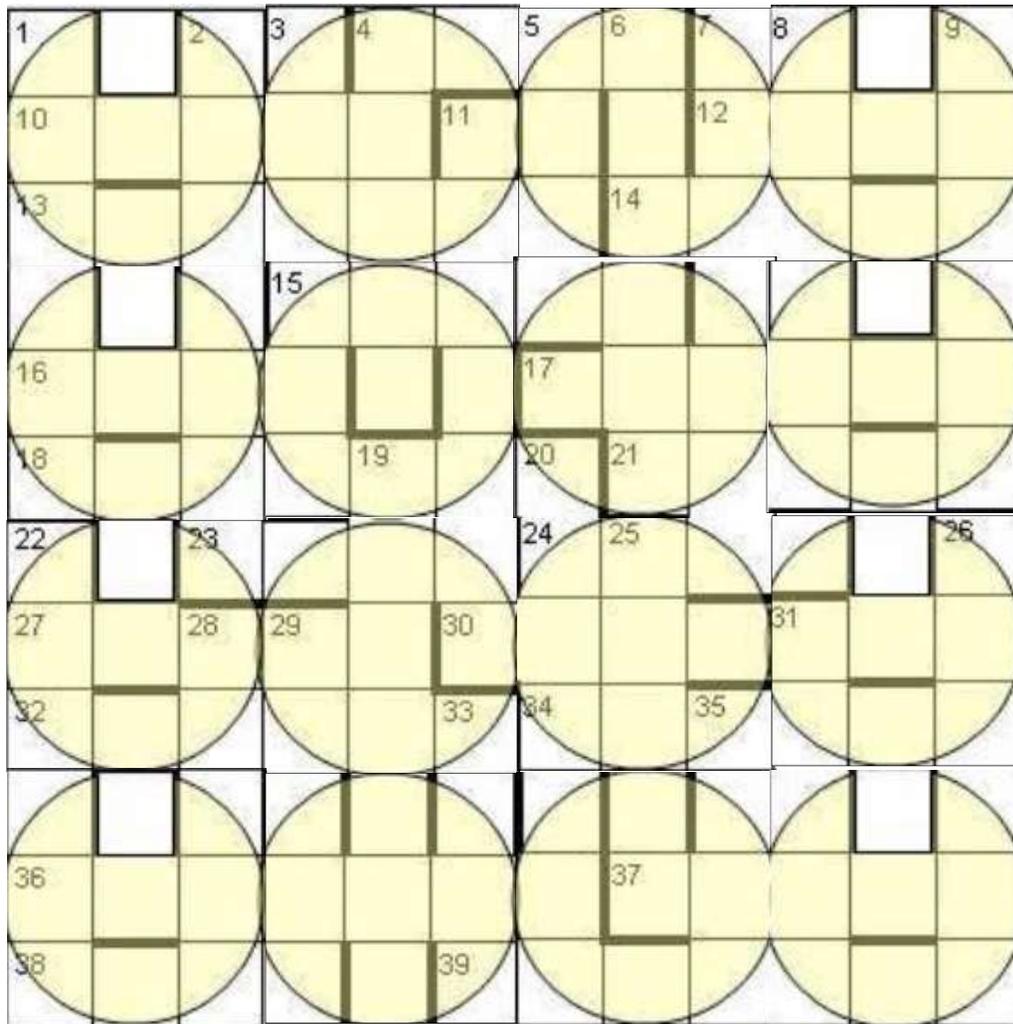
ENTER TITLE'S
FIRST LETTER
IN SLOTS IN
THE TOP ROW.
FROM TOP,
OBEYING
GRAVITY, MOVE
WHEELS HALF
A TURN

A 'P' is the symbol for
a penny....

Listener 4038: 'Playtime' by Samuel

P

P



Listener 4038: 'Playtime' by Samuel



“[The idea for Playtime came to me one day whilst reading postings about a Listener on Derek Harrison’s Crossword Centre message board.] I’d read many times about how a solver had enjoyed the ‘Penny Drop Moment’, or PDM, when solving a puzzle, so I thought to myself – why not give solvers precisely that? A puzzle whereby the penny quite literally drops.”

<http://listenwithothers.com/2009/07/04/4035-playtime-by-samuel-setters-blog/>

What are we working on?

- Recorded 28 participants at Buckingham
 - Solving commissioned crossword (clues n= 27)
 - 18 super-experts; 10 hobbyists
 - Filmed as they did so, talking aloud
- We notice from the recordings
 - Not every clue produces as many PDMs
 - Not everyone gets there in the same way
 - Some analyse their way to the solution, step by step
 - Some have a sudden inspiration
 - And this varies
 - On a clue-by-clue
 - Or person-by-person basis

How can we explore this?

- Verbal Protocol Analysis
 - Of recorded material
- Obtain data on specific dimensions of the clues
 - Approach other solvers
 - Feedback on the crossword
 - For example ‘Well disguised clue mechanism’
 - Might correlate with solving times of our participants
 - But also with the need to restructure the problem
 - Identify groupings of clues working in similar ways
 - Look at how these correlated with solving method
 - Or whether Experts/Hobbyists differed in solving different groupings?

Fleashes out our understanding

- Of what makes a cryptic crossword ‘tick’
 - What the critical elements are
 - From a solver’s point of view
- Of what makes a crossword clue enjoyable
 - Why they give pleasure
 - What leads to an ‘Aha!’ (and what doesn’t)
- Of how insight moments work
 - The antecedents
 - The role of incubation
 - The role of representational change

Thanks very much for listening!

- Any questions?