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A Descriptive Analysis of Valuers' Cognitive Reasoning During a Commercial Property Valuation Task

**24th Annual ERES Conference,
Delft / Netherland
28 June – 1 July, 2017**

Presentation by:

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Background

- The ability of individuals to undertake task successfully has concerned academic and practitioners for millennia.
- This has led to the emergence of expertise as a field of study and this can be broadly categorised into two disciplines (Farrington-Darby and Wilson, 2005)
 - (1) decision making (behavioural), and
 - (2) cognitive psychology.
- Over the past decades, cognitivism has emerged as the dominant paradigm for seeking a practically useful explanation of expertise due to ability to give direction to education and improvement of practice
 - A key advantage is that it can analyse decision making in greater details and deduce the cognitive reasoning of decision makers (Patel et al., 2000)

Problem & Goal

- Most research of expertise in the valuation field focuses mainly on the decision making (behavioural) perspective:
 - (a) Outcomes of decision making (e.g. of Hager and Lord, 1985; Brown, 1992; Hutchison et al., 1995; Adair et al., 1996; Brown et al., 1998; Crosby et al., 1998)
 - (b) Decision-making strategies (e.g. of Diaz, 1997; Diaz and Hansz, 2001; Gallimore, 1994; Havard, 2001)
 - (c) Influences on decision making process (e.g. of Levy and Schuck, 1999; 2005; Baum et al., 2000; McAllister et al., 2004; Crosby et al., 2004; 2010)
- Very few have acknowledge the realities of the practice situation and the cognitive reasoning involved
- Thus, the purpose of the study is to identify and operationalise the cognitive structures and processes used in in ommercial valuation setting

Methodology

- The study was designed to capture expert-novice differences in cognitive reasoning
- The study utilises Cognitive Task Analysis (CTA) and a highly formalised CTA technique of Verbal Protocol Analysis
- The task consisted of an observed, simulated valuation of a warehouse property located in Birmingham, UK
- Three categories of participants were distinguished based on years in practice and professional designation:
 - No practice experience (the novice valuers)
 - Little practice experience (the intermediate valuers)
 - Greater level of practice experience (the expert valuers)
- Given the demands of the use of VPA, Six subjects (two in each subgroup) were considered appropriate for collection of rich information

Methodology (Cont.)

- Participants' verbal protocols were analysed using content and event sequence analysis and the method of protocol analysis developed by Ericsson and Simon (1993):
 - Transcribing and segmenting the verbal protocols in accordance to a complete thought to a clear change in topic
 - Encoding the verbal protocols using pre-determined coding scheme which comprises of two types of protocol representation: (a) knowledge states – valuation information and solution development, (2) problem solving operators – Data examination, Data exploration, Data explanation, Hypothesis, Discrepancy processing, Summarisation and Meta reasoning (Newell and Simon, 1997; Hassebrock and Prietula, 1992)
 - Analysing and interpreting the codes both qualitatively and quantitatively

Methodology (Cont.)

| Protocol Segment | Knowledge State | Problem Solving Operator | |
|------------------|--|---|-------------------------------|
| 124 | What I then need to consider is what <u>adjustment to make with the condition</u> | Technique - Adjustment to valuation opinion | Meta-reasoning: plan |
| 125 | The condition is said to be <u>vandalized and fairly poor and there is structural crack at the back</u> | Physical attribute: condition of property | Summarization: repeat-data |
| 126 | So I think I am being inclined to start looking at this as the benchmark and <u>adjust downward a little bit to make some sort of adjustment for that condition really</u> | Technique - Adjusting downward to reflect condition | Meta-reasoning: plan |

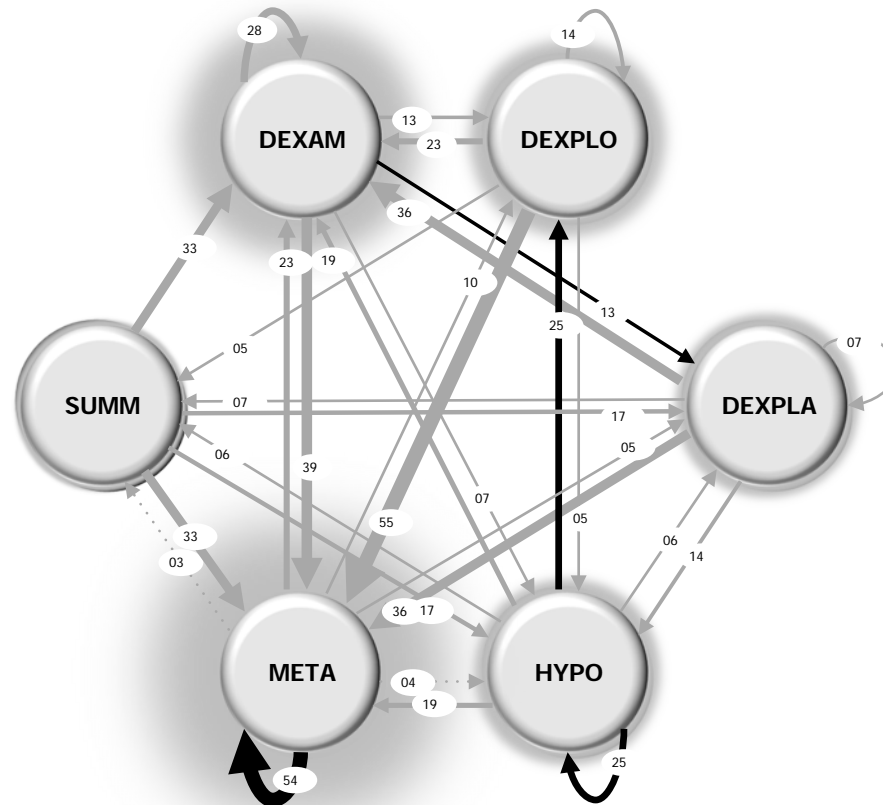
Findings – Knowledge States

| Knowledge state | Novice Valuer | Intermediate Valuer | Expert Valuer |
|-----------------------------|-----------------|---------------------|------------------|
| Data analysis | | | |
| Instruction analysis | 2 (4) | 0 (0) | 9 (5) |
| Property analysis | 11 (20) | 25 (13) | 18 (10) |
| Comparable analysis | 9 (16) | 36 (19) | 37 (19) |
| Sub-Total | 22 (39) | 61 (32) | 64 (33) |
| Self-generated ideas | | | |
| Hypothetical solution | 0 (0) | 10 (5) | 27 (14) |
| Inferred fact | 4 (7) | 4 (2) | 14 (7) |
| Resolution | 0 (0) | 0 (0) | 4 (2) |
| Recommendation | 10 (18) | 27 (14) | 15 (8) |
| Recall | 0 (0) | 12 (6) | 10 (5) |
| Self-reference | 6 (11) | 31 (16) | 30 (16) |
| Sub-Total | 20 (36) | 84 (43) | 100 (52) |
| Technique | 14 (25) | 47 (24) | 29 (15) |
| Total | 56 (100) | 192 (100) | 193 (100) |

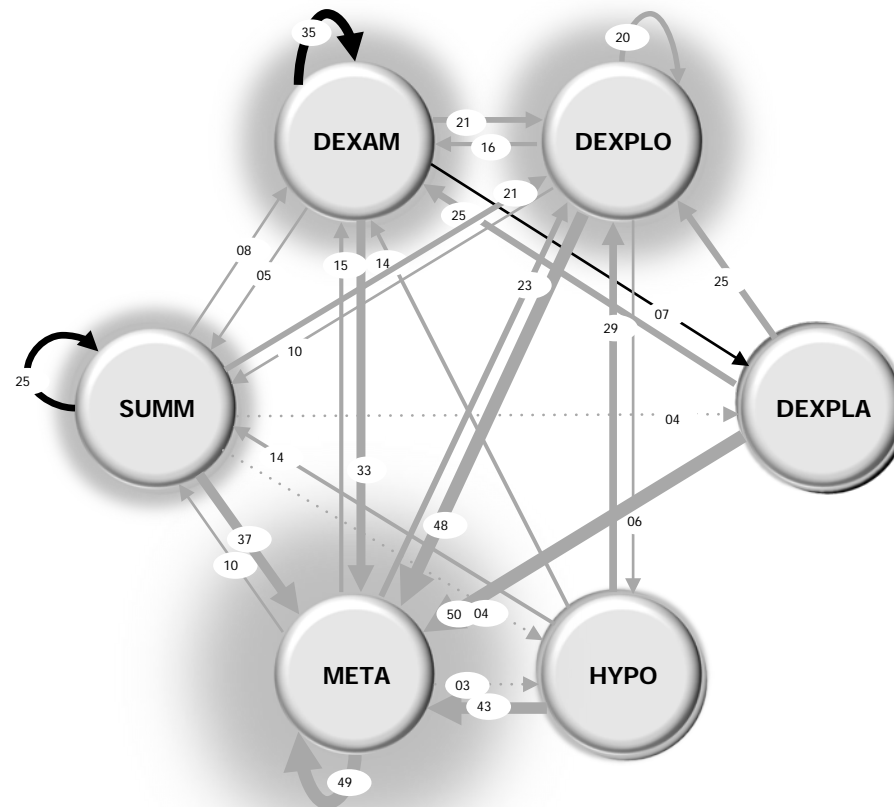
Findings – Problem Solving Operators

| Problem-solving operators | Problem-solving operators | Novice Valuer | Intermediate Valuer | Expert Valuer |
|-------------------------------|---------------------------|---------------|---------------------|---------------|
| Data Examination | Read | 6 (9) | 18 (8) | 19 (9) |
| | Identify | 7 (11) | 9 (4) | 9 (4) |
| | Examine | 9 (14) | 11 (5) | 22 (11) |
| Data Exploration | Apply | 10 (15) | 30 (13) | 10 (5) |
| | Search | 3 (5) | 15 (7) | 7 (3) |
| | Elaborate | 0 (0) | 0 (0) | 0 (0) |
| Data Explanation | Note absence data | 0 (0) | 6 (3) | 5 (2) |
| | Infer | 4 (6) | 4 (2) | 14 (7) |
| | Trigger | 0 (0) | 7 (3) | 13 (6) |
| Hypothesis Generation | Further-specification | 0 (0) | 0 (0) | 2 (1) |
| | Association | 0 (0) | 0 (0) | 2 (1) |
| | Generalisation | 0 (0) | 0 (0) | 0 (0) |
| Hypothesis Evaluation | Confirmation | 0 (0) | 0 (0) | 1 (0) |
| | Disconfirmation | 0 (0) | 0 (0) | 0 (0) |
| | Discrimination | 0 (0) | 0 (0) | 0 (0) |
| Discrepancy Processing | Causal relationship | 0 (0) | 0 (0) | 0 (0) |
| | Recognition | 0 (0) | 0 (0) | 4 (2) |
| | Resolution | 0 (0) | 0 (0) | 4 (2) |
| Meta Reasoning | Plan | 14 (21) | 42 (19) | 28 (13) |
| | Experiential memory | 0 (0) | 12 (5) | 12 (6) |
| | Cue diagnosticity | 6 (9) | 15 (7) | 21 (10) |
| Summarisation | Self-evaluation | 6 (9) | 31 (14) | 30 (14) |
| | Repeat data | 1 (2) | 20 (9) | 6 (3) |
| | Repeat hypothesis | 0 (0) | 0 (0) | 0 (0) |

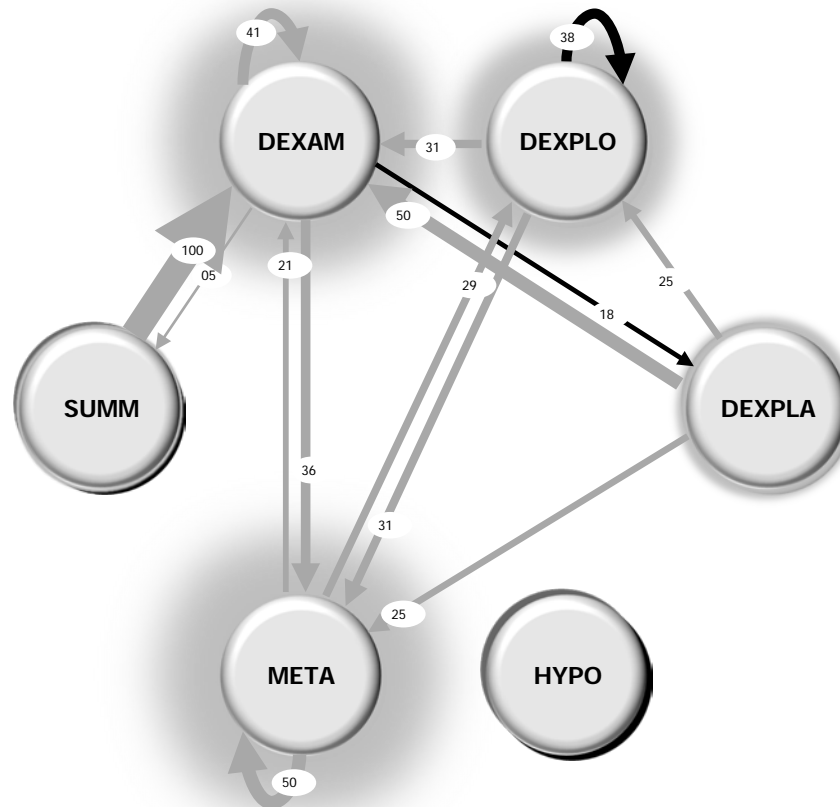
Findings – Thought Processes (Expert)



Findings – Thought Processes (Intermediate)



Findings – Thought Processes (Novice)



Conclusions

- Expert and intermediate valuers have rich cognitive structures which demonstrate cohesiveness and interrelatedness between problem solving activities.
- Expert and intermediate valuers cognitive structures emphasize the need to be highly proficient in data interpretation and meta-reasoning skills in order to be able to transform knowledge, deal with problematic situation and to monitor and evaluate ones reasoning effectively.
- There is a gap in student cognitive development which valuation educators need to address through experiential learning methods

Thanks for Listening!
Q & A