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22 The study of insight in relation to psychosis began in earnest 30 years ago.¹ An anonymous Lancet
23 editorialist commented at the time that such study was “academically nourishing but clinically
24 sterile”.² Now seems a good time to take stock and look forward to the next 30 years. To date there
25 has been much useful conceptual analysis, the production and widespread use of reliable and valid
26 rating instruments and a set of replicable clinical correlations to add to the psychiatric canon. These
27 include correlations between insight and psychopathology, IQ (poorer insight, worse
28 psychopathology and lower IQ), and mood (lower mood, better insight).³ Another obvious and
29 clinically relevant relationship is that between insight and treatment adherence and hence outcome.
30 There is a suggestion that good insight confers a more favourable prognosis over and above
31 adherence although this would be hard to establish through observational studies alone.⁴

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33 **Insight and capacity**

34 The relation between insight and adherence, or rather poor insight and coercive treatment is,
35 naturally, where critics of the insight concept converge. ‘Insight’ they say is mere agreeing with the
36 doctor. A person’s refusal to accept a doctor’s considered diagnosis of say cancer would be deemed
37 extraordinary yet in the case of schizophrenia this is not so. Illness categories in psychiatry remain
38 contested and lacking objective criteria, and the psychiatrist’s authority is not a given. But where a
39 patient’s self-appraisal as not being unwell or needing help is at odds with their peers (including
40 those with lived experience of the condition) and family, might this not be regarded as a lack of
41 insight even without the power imbalance dimension? There is a strong empirical as well as common
42 sense connection between insight and decision-making capacity,⁵ which requires further ethical and
43 practical scrutiny. However, recent qualitative work in medicolegal contexts such as mental health
44 tribunals, finds that ‘lack of insight’ is often used as a proxy for lack of capacity but without
45 corresponding justification and may serve to undermine the individual’s testimony.⁶

46 The interface between insight and capacity to decide upon treatment is seen most vividly in the
47 ability to a ‘use and weigh’ information, a key criterion for mental capacity used in the Mental
48 Capacity Act (2005) definition. It is hard to see how the benefits and harms of a proposed treatment
49 can be weighed in the balance if you don’t believe you are ill in the first place. But rather than
50 clinicians simply pronouncing that insight is lacking it would be more informative to trace the
51 arguments the patient proffers (if any). For example, if he says he is the victim of a conspiracy to rob
52 him of his freedom and force him to take mind-altering drugs for no reason whatsoever, then the

53 benefits or otherwise of treatment are not being weighed in the balance. Alternatively, if the patient
54 describes realistic plans of how she will survive outside of hospital and that she has previously done
55 so without medication, despite her clinician's argument that this has led to relapse, then the
56 statutory authority at least has the basis of a meaningful discussion which they would not have if
57 they had been told merely that the patient's insight is 'partial'.

58 Multidisciplinary enquiry attempting to tackle these and related dilemmas is ongoing thanks to the
59 Wellcome funded Mental Health and Justice programme (mhj.org.uk).

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Metacognition

62 Metacognition is a relatively new area of psychology examining people's ability to reflect upon their
63 own cognition and appears to be related to insight as used in psychiatry. At its most precise it is the
64 degree of confidence a person has on a specific judgement – such as a perceptual decision (did the
65 dots move left or right?) or a mnemonic task (is this word old or new?). The extent to which such
66 confidence is merited is 'metacognitive efficiency.' This takes into account performance level and
67 seems to have a specific cerebral localisation.^{7,8} But is this task-by-task metacognition – whose time
68 course is measured in milliseconds to seconds – related to more day to day self-judgements (did I
69 choose the right route home?) carried out over seconds or minutes? Or to questions like, did I
70 choose the right career? The work of a lifetime perhaps - quite possibly.

71 The cognitive neuroscience of metacognition is beginning to make important contributions to
72 psychopathology.^{9,10} Lack of metacognitive awareness – not reflecting on whether a decision is
73 correct - on even abstract perceptual tasks may link with impulsivity. Low confidence in decisions
74 globally ("I'm bound to be wrong whatever I decide") underpins much thinking in depression, while
75 excessive metacognition can inhibit decision making as in obsessive compulsive disorder. The lack of
76 ability to change one's mind in the light of new evidence is a core feature of delusions. Paradigms
77 that build on advances in metacognitive research and make use of computational modelling also
78 promise much in this regard.¹¹ Models of decision making under conditions of uncertainty are being
79 constructed and tested where personal values are incorporated along with such variables as the
80 strength of current beliefs, contradictory information, and likely benefits of any decision (immediate
81 versus delayed).

Insight and metacognition

83 For insight in psychiatry, the metacognitive challenge posed is to reflect on one's own mental and
84 interpersonal functioning. It involves an attempt to see one's thinking and behaviour 'objectively' as

85 if through another person's eyes and then comparing it to some representation of mental health.
86 There is just one fundamental question asked in relation to clinical insight (after Aubrey Lewis): do I
87 have an illness and is the illness mental? It includes the moment-to-moment evaluation of mental
88 activity (e.g., was someone speaking to me or was it my imagination?) as well as more enduring
89 'semantic' evaluations such as whether my beliefs are true and shared by others. Note that while
90 that representation of mental health will be the amalgam of received opinion and experience, there
91 is no judging doctor, as it were, in sight.

92 Cognitive insight is a new construct put forward by Beck¹² and refers to a cognitive style or
93 propensity to question one's ideas, beliefs and behaviour. One advantage it affords research is that
94 it enables insight to be studied in healthy individuals without confounders such as stigma and the
95 effects of treatment, and thus linked to normal psychological processes – where there is no illness
96 into which one might or might not have insight. An early area of interest is the relationship between
97 cognitive and clinical insight. Thanks to meta-analyses,¹³ we can say that there is a surprisingly weak
98 correlation between the two. However, cognitive insight may have some predictive validity clinically
99 e.g., better cognitive insight leading to fewer symptoms after 1 and 4 years following a first episode
100 of psychosis.¹⁴ We still do not know if poor cognitive insight in a vulnerable individual may be a risk
101 factor for later psychosis *per se*. Or, whether in the event of them developing a psychosis would they
102 have good or poor clinical insight?

103 A relationship between mood and clinical (and cognitive) insight is now well established. It
104 applies to most conditions in which it has been studied: the lower the mood the better the insight¹⁵
105 as noted above. Such is the closeness of the association that it is reasonable to suggest that they are
106 two sides of the same coin and spring from the human condition. The notion is that removal of rose-
107 tinted spectacles reveals the world as it truly is: depressive realism. While this links neatly with
108 metacognition and confidence, it runs counter to received clinical folk lore that the gaining of
109 insight, particularly after a psychotic episode, induces depression and at worst, may even lead to
110 suicide. Empirical justification for unidirectional causality is lacking¹⁶ perhaps because of the messy
111 complicating factors that often precede suicide in people with psychosis in the real world:
112 longstanding depression, rejection of treatment and disengagement with social and professional
113 support. These factors attest more to *loss* of insight than its gain, notwithstanding the pain attached
114 to the latter. Nevertheless, any psychotherapeutic attempt to restore insight (see below) should be
115 in the form of acknowledging difficulties as a first step in gaining mastery over them; encouraging
116 openness to taking up an effective treatment for those symptoms that cause distress at least as a
117 start, and not at all the forced acceptance of some abstract illness model.

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Treatment

120 **Metacognitive therapies**

121 Talking therapies designed to improve metacognition (Metacognitive Therapy and Metacognitive
122 Training) across a range of mental disorders have been developed and tested in small clinical trials. A
123 systematic review¹⁷ found 19 controlled studies in schizophrenia of which 15 were randomised. The
124 results approached significance when compared with standard or other psychological treatments
125 with a pooled standard mean difference in positive symptoms scores estimated to be -0.31 (95%
126 confidence intervals: -0.50 - -0.12). Two small but intensive trials of Metacognitive Reflection and
127 Insight Therapy (MERIT) versus treatment as usual to improve insight and self-reflection in first-
128 episode psychosis¹⁸ and schizophrenia¹⁹ showed encouraging though modest benefits. A larger
129 (n=121) recent multi-centre group-based psychosocial intervention ('REFLEX') with an active control
130 condition showed improvements in insight in both conditions, marginally greater in the main
131 treatment arm.²⁰ To some extent the success of all these therapies depends on the closeness of the
132 link between metacognition and insight which, as discussed is itself a topic of ongoing enquiry.

133 **Medication**

134 Given that worse psychopathology goes with worse insight, any effective treatment should improve
135 insight. However there are both state and trait elements to insight.²¹ A systematic review found
136 rather sporadic evidence that there were insight-enhancing therapies.²² A large open randomized
137 controlled trial: the European First-Episode Schizophrenia Trial (EUFEST) compared haloperidol,
138 amisulpride, olanzapine, quetiapine, and ziprasidone on insight in first-episode schizophrenia and
139 related disorders. There was a highly significant 56% improvement on the insight and judgement
140 item from the Positive and Negative Symptoms of Schizophrenia Scale at 12 months, in line with the
141 level of symptomatic improvement across the board. All the antipsychotic drugs were similar except
142 for quetiapine, which tended to lag behind the others.²³

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Neuroscience

145 Some early, exploratory applications of neuroscientific methods to study insight showed changes
146 within groups of patients with schizophrenia in the direction of more brain volume loss in those
147 rated as having lower insight scores, but these may have been in part the result of confounders to do
148 with general illness severity. More refined imaging techniques (eg examining cortical thickness²⁴)

149 have not come up with a consistent candidate for an 'insight centre' in the brain and nor are they
150 likely to, given the complexity and likely distributed nature of the construct. More hypothesis driven
151 work for example that insight deficits might be linked to the right cerebral hemisphere analogous to
152 anosognosia continues (see²⁵ for review). New technologies have revealed subtle white matter and
153 connectivity problems.^{26,27} However, given the fluctuating nature of insight the promise of functional
154 imaging to shed light on the process has always been greater than structural. More so since a
155 normative functional system underlying self-appraisal and involving a cortical midline network has
156 been established.²⁸ This system may be operating sub-optimally²⁹⁻³¹ in patients with psychosis and
157 this could relate to illness appraisal. Similarly, the default mode network (involving an overlapping
158 area of medial frontal structures activated during internally directed thinking) is a region of interest
159 to insight researchers.³²

160 Given the effectiveness of dopamine blocking drugs to improve psychotic symptoms and insight
161 noted above, it is natural to explore the relationship between D2 receptor blockade and changes in
162 insight. This was studied in 16 schizophrenia patients indirectly using a pharmacological estimation
163 of dopamine blockade based on plasma level concentrations.³³ An association was found at baseline
164 but not after gradual medication dose reduction perhaps because it was swamped by other illness-
165 related measures. So far, neurochemical imaging techniques have yet to be deployed systematically
166 to study insight.

167 A genetic contribution has also be explored by analysing insight in participants in the US Clinical
168 Antipsychotics Trials of Intervention Effectiveness (CATIE) trial. Using the psychosis risk score (PRS)
169 derived from genome wide association studies carried out by the Psychiatric Genomics Consortium,
170 the authors found that patients with the highest PRS had 5.9 times increased risk for poor insight
171 compared to patients with the lowest scores although this only explained 3.2% of the variance in
172 poor insight.³⁴

173 **Neuromodulation**

174 An emerging area of therapeutic research is neuromodulation. Transcranial direct current
175 stimulation (tDCS) is a simple, safe and non-invasive method for selectively modulating cortical
176 excitability. Of interest, anodal tDCS over the dorso-lateral prefrontal cortex has been reported to
177 significantly increase conscious awareness of errors on attention tasks in the elderly.³⁵ Crucially, a
178 pilot study showed that tDCS to same region increased insight in patients with schizophrenia³⁶
179 although unfortunately the study did not utilize a sham control condition.

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181 In conclusion, the study of insight has proved to be both academically stimulating and clinically
182 fertile. As a biopsychosocial construct *par excellence*, the topic has the capacity to bring in new
183 concepts and knowledge from across the spectrum of research relevant to mental disorders. I am
184 personally looking forward to what new insights the next 30 years will bring.

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186 **Acknowledgments**

187 I would like to thank many collaborators including Kevin Ariyo, Steve Fleming, Javier Lopez-Morinigo,
188 Wayne Martin, Andy McWilliams, Jen O'Connor, Gareth Owen, and Elisa van der Plas.

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194 **References**

- 195 1. David AS. Insight and psychosis. *Br J Psychiatry* 1990; 156: 798-808.
- 196 2. Anonymous. Real insight (editorial). *Lancet* 1990; 336: 408
- 197 3. Amador XF, David AS. (Eds). *Insight and psychosis: awareness of illness in schizophrenia and*
198 *related disorders*. 2nd edn. Oxford: Oxford University Press, 2004.
- 199 4. Lincoln TM, Lüllmann E, Rief W. Correlates and long-term consequences of poor insight in
200 patients with schizophrenia. a systematic review. *Schizophrenia Bull* 2007; 33: 1324–1342
- 201 5. Owen GS, Richardson G, David AS, Szmukler G, Hayward P, Hotopf M. Mental capacity, diagnosis,
202 and insight in psychiatric inpatients: a cross sectional study. *Psychological Medicine* 2009; 39:
203 1389-98.
- 204 6. Diesfeld K. Insight: Unpacking the Concept in Mental Health Law. *Psychiatry Psychol and Law*
205 2004, 10:1, 63-70.
- 206 7. Fleming S.M, Weil R.S, Nagy Z et al. Relating introspective accuracy to individual differences in
207 brain structure. *Science* 2010; 329: 1541-1543.
- 208 8. Fleming SM, Ryu J, Golfinos JG, Blackmon KE. Domain-specific impairment in metacognitive
209 accuracy following anterior prefrontal lesions. *Brain* 2104, 137:2811-2822.
- 210 9. Rouault M, Seowa T, Gillan CM, Fleming SM. Psychiatric Symptom Dimensions Are Associated
211 With Dissociable Shifts in Metacognition but Not Task Performance. *Biological Psychiatry* 2018;
212 84: 443 – 451
- 213 10. David AS, Bedford N, Wiffen B, Gilleen J. Failures of metacognition and lack of insight in
214 neuropsychiatric disorders. *Phil Trans R Soc B* 2012; 267:1379-90.
- 215 11. van der Plas E, David AS, Fleming SM. Advice-taking as a bridge between decision neuroscience
216 and mental capacity. *Int J Law and Psychiat* (under review),
- 217 12. Beck AT, Baruch E, Balter JM, Steer RA, Warman DM. A new instrument for measuring insight:
218 the Beck Cognitive Insight Scale. *Schizophr Res* 2004; 68: 319-329.
- 219 13. Van Camp LSC, Sabbe BGC, Oldenburg JFE. Cognitive insight: A systematic review. *Clin Psychol*
220 *Rev* 2017; 55: 12-24.
- 221 14. O’Connor JA, Ellett L, Ajnakina O, Schoeler T, Kolliakou A, Trotta A, Wiffen BD, Falcone AM, Di
222 Forti M, Murray RM, Bhattacharyya S, David AS. Can cognitive insight predict symptom remission
223 in a first episode psychosis cohort? *BMC Psychiatry* 2017; 17: 54.
- 224 15. Murri MB, Respino M, Innamorati M, Cervetti A, Calcagno P, Pompili M, Lamis DA, Ghio L, Amore
225 M. Is good insight associated with depression among patients with schizophrenia? Systematic
226 review and meta-analysis, *Schizophr Res* 2015; 162: 234-47.

- 227 16. Lopez-Morinigo JD, Di Forti M, Ajnakina O. Insight and risk of suicidal behaviour in two first-
228 episode psychosis cohorts: Effects of previous suicide attempts and depression. *Schizophr Res*
229 2019; 204: 80-89.
- 230 17. Philipp R, Kriston L, Lanio J, Kühne F, Härter M, Moritz S, Meistert R. Effectiveness of
231 metacognitive interventions for mental disorders in adults—A systematic review and meta-
232 analysis (METACOG). *Clin Psychol Psychother* 2019; 26: 227– 240.
233 <https://doi.org/10.1002/cpp.2345>
- 234 18. Vohs JL, Leonhardt BL, James AV, Francis MM, Breier A, Mehdiyoun N, Visco AC, Lysaker PH.
235 Metacognitive Reflection and Insight Therapy for Early Psychosis: A preliminary study of a novel
236 integrative psychotherapy. *Schizophr Res* 2018; 195: 428-433.
- 237 19. De Jong S, van Donkersgoed R, Timmerman M, Aan het Rot M, Wunderink L, Arends J,
238 Pijnenborg G. Metacognitive reflection and insight therapy (MERIT) for patients with
239 schizophrenia. *Psychological Medicine* 2019; 49: 303-313
- 240 20. Pijnenborg GHM, Vos AE, Timmerman ME, van der Gaag M, Sportel BE, Arends J, Koopmans EM,
241 van der Meer L, Aleman A. Social cognitive group treatment for impaired insight in psychosis: A
242 multicenter randomized controlled trial. *Schizophr Res* 2019; 206: 362-369.
- 243 21. Wiffen, BDR, Rabinowitz J, Lex A, David AS. Correlates, change and ‘state or trait’ properties of
244 insight in schizophrenia. *Schizophrenia Research* 2010; 122: 94–103.
- 245 22. Pijnenborg GHM, van Donkersgoed RJM, David AS, Aleman A. Changes in insight during
246 treatment for psychotic disorders: A meta-analysis. *Schizophr Res* 2013; 144: 109-117.
- 247 23. Pijnenborg GH, Timmerman ME, Derks EM, Fleischhacker WW, Kahn RS, Aleman A. Different
248 effects of antipsychotic drugs on insight in patients with first episode of schizophrenia. Data
249 from Data from the European First-Episode Schizophrenia Trial (EUFEST). *European*
250 *Neuropsychopharmacol* 2015; 25: 808-816.
- 251 24. Béland S, Makowski C, Konsztowicz S, Buchy L, Chakravarty MM, Lepage M. Clarifying
252 associations between cortical thickness, subcortical structures, and a comprehensive assessment
253 of clinical insight in enduring schizophrenia, *Schizophr Res* 2019; 204: 245-252.
- 254 25. Morgan KD, Dazzan P, Morgan C, Lappin J, Hutchinson G, Suckling J, Fearon P, Jones PB, Leff J,
255 Murray RM, David AS. Insight, grey matter and cognitive function in first-onset psychosis. *Br J*
256 *Psychiatry* 2010; 197: 141-148.
- 257 26. Asmal L, du Plessis S, Vink M, Fouche J-P, Chiliza B, Emsley R. Insight and white matter fractional
258 anisotropy in first-episode schizophrenia. *Schizophrenia Research* 2017; 183: 88-94.

- 259 27. Ćurčić-Blake, B, van der Meer L, Pijnenborg GH, David AS, Aleman A. Insight and psychosis:
260 Functional and anatomical brain connectivity and self-reflection in Schizophrenia. *Hum Brain*
261 *Mapp* 2015; 36: 4859-4868.
- 262 28. van der Meer L, Costafreda SC, Aleman A, David AS. Self-reflection and the brain: a theoretical
263 review and meta-analysis of neuroimaging studies with implications for schizophrenia. *Neurosci*
264 *Biobehav Rev* 2010; 34: 935-46.
- 265 29. Holt DJ, Cassidy BS, Andrews-Hanna JR et al. An anterior-to-posterior shift in midline cortical
266 activity in schizophrenia during self-reflection. *Biol Psychiat* 2011; 69:415–423.
- 267 30. Bedford N, Surguladze S, Giampietro V, Brammer MJ, David AS. Self-evaluation in schizophrenia:
268 an fMRI study with implications for the understanding of insight. *BMC Psychiatry* 21012; 12:106
- 269 31. van der Meer L, de Vos AE, Stiekema APM, Pijnenborg GHM, van Tol M-J, Nolen WA, David AS,
270 Aleman A. Insight in schizophrenia: involvement of self-reflection networks? *Schizophrenia Bull*
271 2012. doi: 10.1093/schbul/sbs12
- 272 32. Gerretsen P, Menon M, Mamo DC, Fervaha G, Remington G, Pollock BG, Graff-Guerrero A.
273 Impaired insight into illness and cognitive insight in schizophrenia spectrum disorders: Resting
274 state functional connectivity. *Schizophrenia Research* 2014; 160: 43-50.
- 275 33. Gerretsen P, Takeuchi H, Ozzoude M, Graff-Guerrero A, Uchida H. Insight into illness and its
276 relationship to illness severity, cognition and estimated antipsychotic dopamine receptor
277 occupancy in schizophrenia: An antipsychotic dose reduction study. *Psychiatry Res* 2017; 251:
278 20-25.
- 279 34. Xavier RM, Vorderstrasse A, Keefe RSE, Dungan JR. Genetic correlates of insight in schizophrenia,
280 *Schizophrenia Research* 2108; 195: 290-297.
- 281 35. Harty S, Robertson IH, Miniussi C, Sheehy OC, Devine CA, McCreery S, O’Connell RG. Transcranial
282 direct current stimulation over right dorsolateral prefrontal cortex enhances error awareness in
283 older age. *J Neurosci* 2010; 34:3646 –3652.
- 284 36. Bose A, Shivakumar V, Narayanaswamy JC, Nawani H, Subramaniam A, Agarwal SM, Chhabra H,
285 Kalmady SV, Venkatasubramanian G. Insight facilitation with add-on tDCS in schizophrenia.
286 *Schizophr Res* 2014; 156:63-65.

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